UK MET OFFICE
GLOBAL DATA MONITORING REPORT

May 2005

ORGS UKMO U
10 JUN 2005
National Meteorological Library
FitzRoy Road, Exeter, Devon. EX1 3PB

Data Assimilation
Meteorological Office
Fitzroy Rd
Exeter
Devon
EX1 3PB

This report has not been published. Permission to quote from it should be obtained from the Head of Data Assimilation

Distribution List

Mr B Sumner	NMC, Victoria, Australia
Dr S. C. Chou	CPTEC/INPE, Brazil
Dr V Wagner	Deutscher Wetterdienst, Hamburg, Germany
Dr B Ballish	NCEP, Camp Springs, USA
Mr H Benichou	SCEM METEO-FRANCE.
Mr E A Meindl	National Data Buoy Centre, Stennis Space Center, USA
Mr G Verner	Canadian Meteorological Centre, Quebec, Canada
Dr R Pauley	Fleet NumericalMETOC Center, Moneterey
Permanent Rep. with WMO	Moscow, Russia
Hydrometcentre of the Russian Federation	Moscow, Russia
Mr Yukinari Ohta	JMA, Tokyo, Japan
Mr Francois Lalaurette	Head, Meteorological Operations Section, ECMWF, Reading, UK
Dr M J Uddstrom	Met. Service, Wellington, New Zealand
Mr R W Lunnon	Met. Office, Exeter, UK
Mr D Richardson	Met. Office, Exeter, UK
Mr B Oatway	Met. Office, Exeter, UK
Mr C A Parrett	Met. Office, Exeter, UK
National Meteorological Library	Met. Office, Exeter, UK

CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

3. Composite Observing Systems for the North Atlantic (COSNA)

...oooOOOooo...

1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

Mr. D. Richardson
Observations Data Monitoring Group
Met Office
Fitzroy Road
Exeter
Devon
United Kingdom
EX1 3PB

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).
:Air temperature (Degrees C).
:Relative Humidity (%).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)
:15 degrees (air temperature)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 $m\ s^{-1}$	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
	≥ 4 degrees	(air temperature)
	≥ 15%	(relative humidity)
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
	≥ 6 degrees	(air temperature)
	≥ 25%	(relative humidity)
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AUFI	P	24	0	4	2.3	4.1	4.7
A8EG9	P	39	0	26	2.1	4.5	5.0
A8GX4	P	53	0	77	1.4	-4.7	4.9
A8XG4	P	40	0	50	1.7	-4.2	4.5
ELYY5	P	34	0	0	0.9	6.2	6.2
HQTEST	P	413	0	100	0.6	-12.4	12.4
H9JT	P	50	6	26	1.1	-4.3	4.5
KS049	P	239	0	1	0.9	-4.6	4.7
P3XQ9	P	20	0	100	1.7	7.3	7.4
TEST	P	118	56	100	7.0	-0.8	7.0
TESTF	P	20	100	100			
UASU	P	99	1	80	2.8	-4.1	5.0
UBAW	P	31	0	100	6.9	-1.1	7.0
UDYG	P	25	0	100	1.5	8.6	8.8
UIBM	P	25	0	32	2.6	4.2	4.9
VTXL	P	70	0	69	2.2	5.0	5.5
VVKV	P	21	0	71	1.0	4.8	4.9
V2GR	P	37	0	0	1.0	4.0	4.1
WADZ	P	66	64	100	2.0	12.2	12.4
WCY7054	P	30	0	63	3.1	6.3	7.0
ZCBN9	P	63	0	21	1.7	4.2	4.6
41033	P	52	0	79	1.4	-6.0	6.1

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
C6QF6	SPEED	44	0	100	3.4	6.8	7.6
ELUP5	SPEED	27	0	26	4.2	6.2	7.4
ELVP2	SPEED	49	0	100	4.8	5.3	7.2
ELXU5	SPEED	24	0	25	4.1	5.1	6.6
FNYF	SPEED	116	11	36	7.0	5.4	8.8
H9YY	SPEED	43	0	100	4.7	6.4	7.9
KS050	SPEED	126	9	60	7.0	6.4	9.4
MZHC8	SPEED	33	3	45	4.2	6.4	7.7
OYVQ2	SPEED	20	10	25	4.0	5.6	6.9
TEST	SPEED	94	16	100	6.5	8.4	10.6
V2AH1	SPEED	24	0	100	4.3	7.1	8.3

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CC9	DIRN.	37	0	0	89.2	-28.0	93.5
ELWX5	DIRN.	214	0	0	38.3	-47.4	61.0
FPOD	DIRN.	25	0	0	68.6	-32.4	75.9
H9LV	DIRN.	20	0	0	44.6	-53.1	69.4
KS044	DIRN.	43	0	0	45.4	-57.2	73.0
UAMX	DIRN.	29	7	0	30.5	35.7	46.9
23092	DIRN.	27	0	0	25.8	-53.0	58.9
52084	DIRN.	63	0	0	55.9	-68.0	88.0

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MASH6	T	66	0	100	1.3	4.0	4.2
OUVU2	T	22	0	100	3.3	4.6	5.7
SP33	T	123	0	100	2.5	-4.6	5.3
TEST	T	138	49	100	5.6	-7.5	9.4
TESTF	T	20	25	100	1.5	12.7	12.8
UAIS	T	21	0	100	2.6	7.0	7.5
UIAG	T	31	0	100	1.3	-6.9	7.0
WCW9126	T	112	3	100	2.9	9.2	9.7
WCY2920	T	24	29	100	2.9	3.4	4.4

WDA2311	T	86	1	100	3.1	4.5	5.5
WDB6493	T	23	4	100	3.3	7.8	8.5
WE4805	T	50	36	100	2.8	0.3	2.8
WMVC	T	32	6	100	3.6	9.1	9.8
WTEB	T	24	4	100	2.1	4.5	4.9
WTEF	T	33	3	100	3.5	7.7	8.4
WWU8	T	26	0	100	2.5	9.8	10.1
46081	T	742	4	100	2.5	8.3	8.7

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CI8	RH	40	0	100	9.0	15.5	17.9
C6FM7	RH	45	0	100	6.7	16.4	17.8
DBBU	RH	338	0	100	8.6	-76.8	77.2
DGCR	RH	165	0	100	13.3	-16.5	21.2
ELOV9	RH	49	0	100	9.1	15.4	17.8
FNAT	RH	56	0	100	5.1	20.8	21.4
HQTEST	RH	413	0	100	12.5	-21.0	24.4
OUEW	RH	133	0	100	23.4	-24.2	33.7
PBFM	RH	63	0	100	8.3	16.9	18.9
PJHA	RH	59	0	100	6.2	17.0	18.1
P3BA7	RH	66	0	100	13.9	-18.8	23.4
TESTF	RH	20	0	100	11.9	-31.0	33.3
VVGG	RH	22	0	100	9.2	-17.7	19.9
46054	RH	198	0	100	11.9	15.4	19.5

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8FJ8	SST	49	0	47	3.0	3.3	4.5
CG2350	SST	212	8	92	2.8	3.0	4.1
DBBA	SST	623	0	100	2.6	3.7	4.5
DEFL	SST	38	0	100	0.8	3.8	3.9
DGGV	SST	32	0	100	0.6	3.3	3.3
ELXL3	SST	41	0	100	3.0	3.8	4.8
H9TO	SST	44	0	100	0.8	3.0	3.1
JKHH	SST	80	0	100	2.8	3.2	4.3
KHRP	SST	39	0	21	0.6	3.4	3.4
KS049	SST	168	0	114	2.5	-3.2	4.1
MASH6	SST	54	0	93	1.0	4.4	4.5
PDKU	SST	25	4	100	2.1	5.9	6.3
PFRO	SST	29	0	100	2.2	3.9	4.5
P3NF5	SST	25	0	92	1.5	-4.7	4.9
S6IW	SST	27	0	100	1.8	4.4	4.7
TEST	SST	39	67	144	1.7	1.8	2.5
TSMU	SST	35	0	83	0.9	-4.9	4.9
UCNK	SST	20	0	80	2.2	-6.2	6.6
VRUR7	SST	22	0	82	3.4	3.1	4.6
VVKV	SST	21	0	100	1.4	3.6	3.8
V7CZ6	SST	43	0	33	2.0	-3.2	3.8
WAAH	SST	64	0	100	1.5	3.7	4.0
WGJF	SST	50	16	100	2.2	-6.5	6.9
WRFJ	SST	35	0	20	0.8	3.2	3.3
WSRH	SST	37	0	19	0.9	-3.0	3.2
Y3CH	SST	392	1	100	2.7	5.2	5.8
ZDGR8	SST	25	0	48	2.4	3.8	4.5
23094	SST	147	0	86	2.6	-6.8	7.3
3FKM8	SST	30	0	100	2.2	-4.9	5.4
3FMV4	SST	20	15	85	1.4	-4.6	4.8
3FPA6	SST	78	3	100	1.3	4.3	4.5
44014	SST	622	0	100	1.3	-4.9	5.1
45008	SST	207	0	100	1.5	-4.1	4.4

45149	SST	621	0	100	1.3	-4.5	4.6
45151	SST	563	2	100	1.5	6.4	6.6
45154	SST	573	0	48	2.1	3.5	4.1
9HCH7	SST	51	0	100	0.6	3.6	3.7

Figure 1. SHIP/SYNOP mean daily count. MAY 2005
All hours
Global average number of observations in 24 hours = 21709

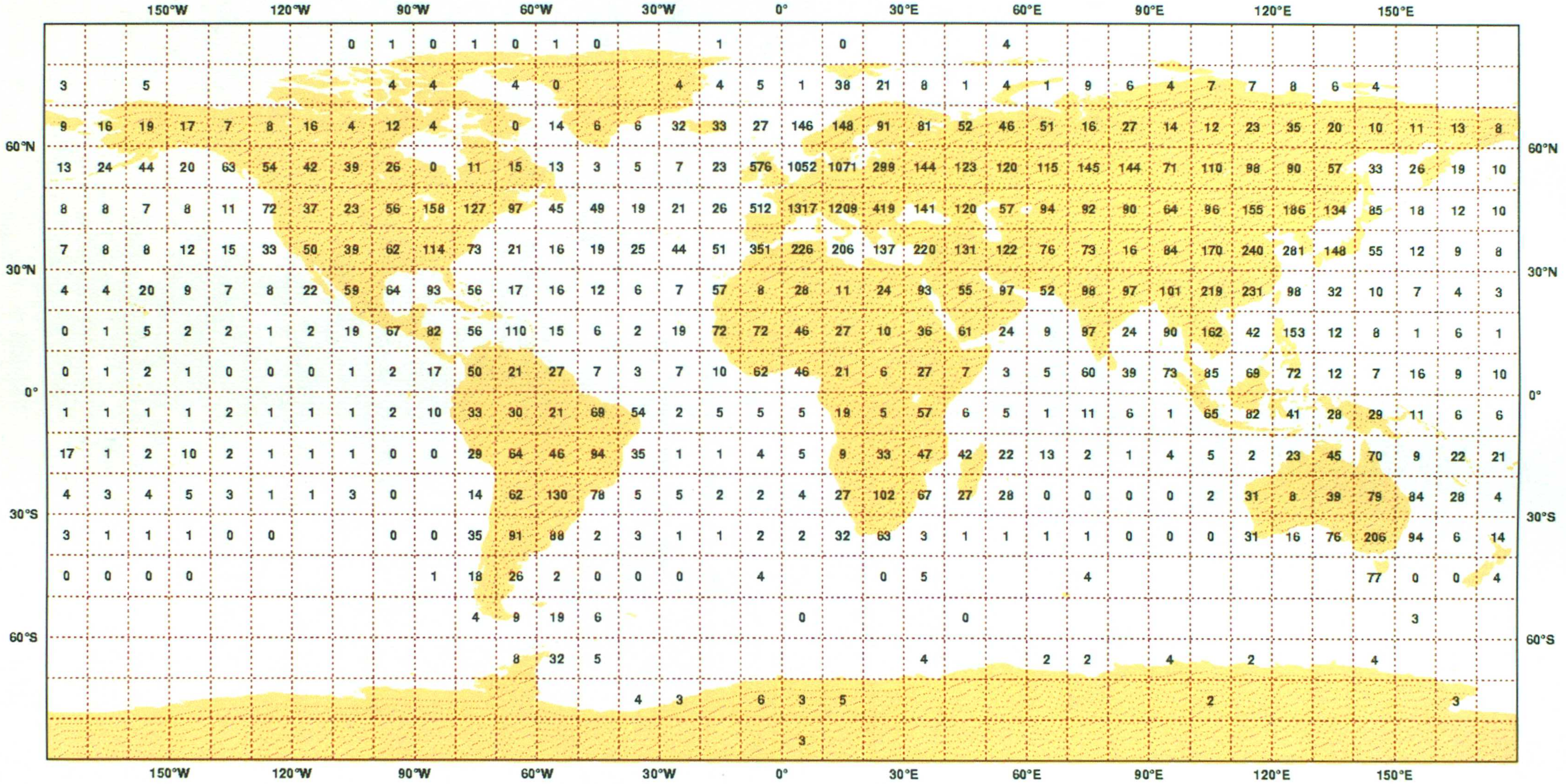

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 1 0 1 0 4
3 5 4 4 4 0 4 4 5 1 38 21 8 1 4 1 9 6 4 7 7 8 6 4
9 16 19 17 7 8 16 4 12 4 0 14 6 6 32 33 27 146 148 91 81 52 46 51 16 27 14 12 23 35 20 10 11 13 8
13 24 44 20 63 54 42 39 26 0 11 15 13 3 5 7 23 576 1052 1071 299 144 123 120 115 145 144 71 110 98 90 57 33 26 19 10
8 8 7 8 11 72 37 23 56 158 127 97 45 49 19 21 26 512 1317 1209 419 141 120 57 94 92 90 64 96 155 186 134 85 18 12 10
7 8 8 12 15 33 50 39 62 114 73 21 16 19 25 44 51 351 226 206 137 220 131 122 76 73 16 84 170 240 281 148 55 12 9 8
4 4 20 9 7 8 22 59 64 93 56 17 16 12 6 7 57 8 28 11 24 93 55 97 52 98 97 101 219 231 98 32 10 7 4 3
0 1 5 2 2 1 2 19 67 82 56 110 15 6 2 19 72 72 46 27 10 36 61 24 9 97 24 90 162 42 153 12 8 1 6 1
0 1 2 1 0 0 0 1 2 17 50 21 27 7 3 7 10 62 46 21 6 27 7 3 5 60 39 73 85 69 72 12 7 16 9 10
1 1 1 1 2 1 1 1 2 10 33 30 21 69 54 2 5 5 5 19 5 57 6 5 1 11 6 1 65 82 41 28 29 11 6 6
17 1 2 10 2 1 1 1 0 0 29 64 46 94 35 1 1 4 5 9 33 47 42 22 13 2 1 4 5 2 23 45 70 9 22 21
4 3 4 5 3 1 1 3 0 14 62 130 78 5 5 2 2 4 27 102 67 27 28 0 0 0 0 2 31 8 39 79 84 28 4
3 1 1 1 0 0 0 0 35 91 88 2 3 1 1 2 2 32 63 3 1 1 1 1 0 0 0 31 16 76 206 94 6 14
0 0 0 0 1 18 26 2 0 0 0 4 0 5 4 77 0 0 4
4 9 19 6 0 0 3
8 32 5 4 2 2 4 2 4
4 3 6 3 5 2 3
3

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ : Percentage of observations flagged excluding those with gross errors

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|
≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).
≥ 3 degrees (sea surface temperature).

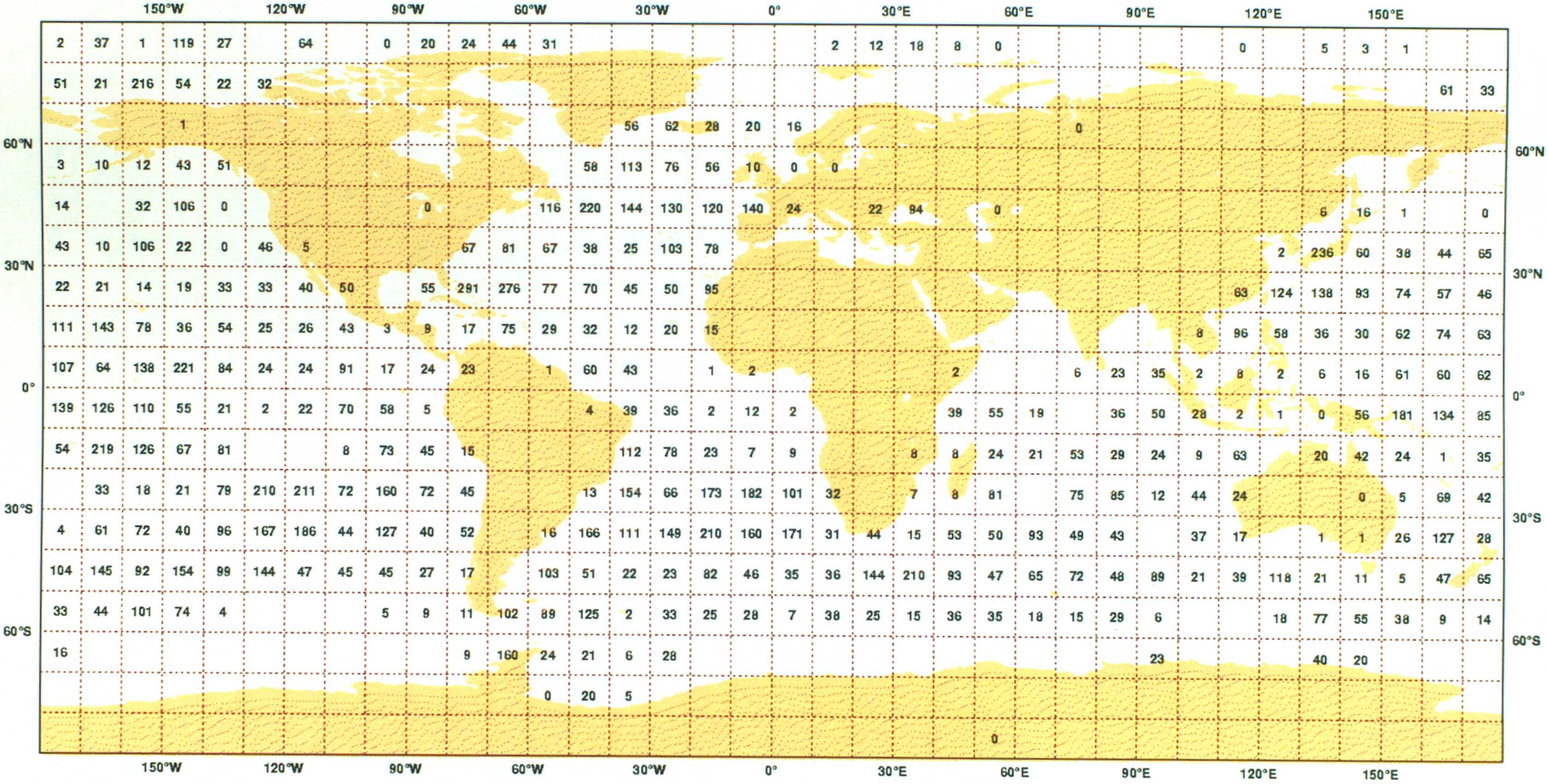
2.SD
≥ 6 hPa (pressure),
≥ 80 degrees (direction).
≥ 5 degrees (sea surface temperature).

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

```
IDENTIFIER  LAT.  LONG.  ELEM   NOBS  PGE  %REJ   SD   BIAS   RMS

17910      -50.5   31.6    P     815    0    87  2.9    7.0   7.6
25573       85.0  151.6    P      30   50   100  6.0   -5.9   8.4
41921       26.2  -75.2    P     305    1   100  3.2    7.8   8.4
41924       24.2  -73.7    P     326    5    95  3.2    7.9   8.5
48532       60.3    5.4    P      70    4   100  0.4  -13.8  13.8

48535       60.3    5.4    P     218    0   100  0.4  -13.8  13.8
48539       60.3    5.4    P      51    2   100  0.5  -13.7  13.7
48543       60.3    5.4    P     135    1   100  0.5  -13.8  13.8

IDENTIFIER  LAT.  LONG.  ELEM   NOBS  PGE  %REJ   SD   BIAS   RMS

56506      -19.2  117.2  DIRN.   140    0     0 16.0  ***** 133.4

IDENTIFIER  LAT.  LONG.  ELEM   NOBS  PGE  %REJ   SD   BIAS   RMS

17559      -34.7  -15.7   SST    618  100   100
32538       -5.9 -103.4   SST    366    0   100  0.2   -4.1   4.1
32620       -5.5 -113.2   SST    420    0   100  0.3   -4.0   4.0
32623        4.0  -79.0   SST    394    0   100  0.5   -4.4   4.4
32693       18.7 -179.1   SST    702    0   100  0.2    3.4   3.4

32741        5.3  -89.6   SST    358    0   100  0.3   -4.1   4.1
33671      -40.1   23.5   SST    487    1    61  1.4   -3.3   3.6
41912       30.1  -62.9   SST    560    0   100  0.4   -3.7   3.7
44507       47.4  -50.0   SST    612   38    39  0.6    0.6   0.8
44508       49.8  -49.1   SST    676   40    40  0.5    1.3   1.4

44512       47.4  -47.6   SST    340   53   100  4.5    2.5   5.1
46972       16.5  124.6   SST    242    0   100  0.4    5.7   5.7
64611       65.2  -32.0   SST    171    0    99  0.5    8.4   8.4
```

Figure 2. DRIFTER mean daily count. MAY 2005
All hours
Global average number of observations in 24 hours = 19144



2	37	1	119	27		64		0	20	24	44	31							2	12	18	8	0						0		5	3	1		
51	21	216	54	22	32																													61	33
			1											56	62	28	20	16							0										
3	10	12	43	51									58	113	76	56	10	0	0																
14		32	106	0					0			116	220	144	130	120	140	24		22	94		0								6	16	1		0
43	10	106	22	0	46	5				67	81	67	38	25	103	78														2	236	60	38	44	65
22	21	14	19	33	33	40	50		55	291	276	77	70	45	50	95													63	124	138	93	74	57	46
111	143	78	36	54	25	26	43	3	9	17	75	29	32	12	20	15												8	96	58	36	30	62	74	63
107	64	138	221	84	24	24	91	17	24	23		1	60	43		1	2					2			6	23	35	2	8	2	6	16	61	60	62
139	126	110	55	21	2	22	70	58	5				4	39	36	2	12	2				39	55	19		36	50	28	2	1	0	56	181	134	85
54	219	126	67	81			8	73	45	15				112	78	23	7	9			8	8	24	21	53	29	24	9	63		20	42	24	1	35
	33	18	21	79	210	211	72	160	72	45			13	154	66	173	182	101	32		7	8	81		75	85	12	44	24			0	5	69	42
4	61	72	40	96	167	186	44	127	40	52		16	166	111	149	210	160	171	31	44	15	53	50	93	49	43		37	17		1	1	26	127	28
104	145	92	154	99	144	47	45	45	27	17		103	51	22	23	82	46	35	36	144	210	93	47	65	72	48	89	21	39	118	21	11	5	47	65
33	44	101	74	4				5	9	11	102	89	125	2	33	25	28	7	38	25	15	36	35	18	15	29	6			18	77	55	38	9	14
16										9	160	24	21	6	28												23				40	20			
												0	20	5																					
																							0												

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION MAY 2005

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.4W	2	MS	56	0	0	0	1.2	-8.7	8.8
60423	36.3N	8.0E	680	S8	91	89	98	99	5.8	-9.1	10.8
62056	32.8N	21.9E	625	S8	74	0	0	1	1.0	-5.4	5.5
63671	1.8N	40.1E	244	M	117	1	1	0	1.3	-4.7	4.9
63801	4.9S	29.6E	882	S8	53	1	2	2	2.9	7.9	8.4
63881	8.0S	31.6E	1923	S	53	1	2	0	0.6	13.3	13.3
65125	9.3N	7.0E	344	M	29	0	0	0	1.2	4.0	4.2
65355	9.8N	1.1E	342	MS	62	1	2	0	1.8	-11.7	11.8
67229	14.7S	34.3E	1270	S8	43	16	37	98	1.0	13.3	13.3
67295	19.1S	33.5E	731	S8	54	12	22	98	0.5	13.9	13.9
68014	19.6S	18.1E	1411	S8	84	0	0	0	0.6	-7.6	7.6
68030	18.5S	25.6E	1071	S8	86	0	0	0	4.0	9.4	10.2
68102	19.9S	16.4E	1343	S8	120	0	0	0	0.6	5.6	5.6
68300	26.6S	15.1E	16	MS	33	5	15	76	0.6	-14.0	14.0
68312	26.5S	18.1E	1067	S8	84	1	1	0	0.6	4.7	4.7
68396	26.5S	31.3E	641	S8	60	0	0	2	1.3	4.8	5.0
68575	30.0S	30.0E	1175	S8	124	124	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	124	0	0	0	0.8	12.0	12.0
36982	41.9N	78.2E	3635	S7	123	0	0	0	0.6	6.2	6.2
38565	40.6N	65.7E	485	MS	124	123	99	0	0.0	0.7	0.7
38846	38.4N	70.0E	1437	S8	96	2	2	1	1.5	-5.9	6.1
40435	27.0N	44.1E	991	MS	62	0	0	0	1.2	7.9	8.0
40700	39.6N	47.9E	45	MS	115	0	0	0	0.9	-5.5	5.6
40713	37.4N	46.3E	1475	MS	116	2	2	0	0.7	12.7	12.7
40719	37.2N	49.6E	-9	MS	68	0	0	97	1.1	6.0	6.1
40741	36.5N	61.2E	235	MS	114	0	0	0	0.9	-4.8	4.9
40743	36.2N	57.7E	978	MS	116	0	0	0	0.9	4.5	4.6
40780	33.6N	46.4E	1362	MS	116	1	1	1	1.1	5.1	5.2
40854	29.1N	58.4E	1067	MS	114	2	2	2	0.8	11.3	11.3
41252	23.4N	56.5E	244	MS	107	0	0	0	0.8	-8.8	8.8
41254	23.1N	57.6E	1755	S8	123	123	100	0			
41396	16.0N	48.9E	700	MS	75	1	1	1	1.0	5.7	5.8
41466	13.7N	44.1E	1402	8	70	3	4	1	1.7	-5.8	6.0
47022	40.8N	128.2E	1224	S	92	0	0	0	1.0	4.9	5.0
47678	33.1N	139.8E	79	MS	124	0	0	0	0.7	-9.1	9.1
50727	47.2N	119.9E	1028	MS	124	0	0	0	0.7	4.0	4.1
50978	45.3N	130.9E	234	MS	124	0	0	0	0.7	-6.0	6.0
52866	36.6N	101.8E	2262	S	124	0	0	1	1.1	-4.1	4.2
53646	38.3N	109.8E	1058	MS	124	0	0	0	0.7	-12.1	12.1
56462	29.0N	101.5E	2994	S	124	0	0	0	1.3	8.4	8.5
56768	25.0N	101.5E	1773	S	124	0	0	0	0.7	-5.8	5.8
57816	26.6N	106.7E	1074	MS	124	84	68	0	0.3	-14.6	14.6
59663	21.8N	112.0E	22	MS	124	0	0	0	0.6	-7.4	7.4

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	122	MS	30	0	0	0	1.4	-5.2	5.4
82181	2.0S	54.1W	146	MS	85	0	0	0	1.0	5.2	5.3
82586	5.2S	39.3W	212	MS	92	1	1	1	1.1	-4.1	4.2
82704	7.6S	72.7W	170	S	71	0	0	0	0.9	-4.6	4.7
83235	12.4S	46.4W	604	MS	92	0	0	0	0.8	5.8	5.9
83332	14.1S	46.4W	826	MS	90	3	3	0	0.7	13.1	13.1
83470	17.9S	50.9W	727	MS	87	0	0	1	0.9	-5.8	5.9
83531	18.6S	46.5W	940	MS	90	0	0	0	0.6	-6.7	6.7
83836	25.5S	50.6W	837	MS	92	0	0	0	0.7	-4.5	4.6
84401	5.2S	80.6W	49	MS	119	0	0	1	0.8	4.3	4.4
84425	5.9S	76.1W	179	MS	25	0	0	0	1.3	5.1	5.3
84452	6.8S	79.8W	29	MS	115	0	0	0	0.8	5.6	5.7
84455	6.5S	76.4W	281	MS	86	1	1	0	1.6	7.6	7.8
84472	7.1S	78.5W	2620	S	57	0	0	0	0.8	-5.2	5.3
84474	7.2S	76.7W	350	S	25	0	0	0	1.3	10.2	10.3
84501	8.1S	79.0W	26	MS	81	0	0	0	0.8	4.5	4.6
84686	13.6S	72.0W	3248	S	114	0	0	0	0.8	-4.1	4.2
84688	13.7S	73.4W	3444	S	51	0	0	0	0.4	-12.6	12.6
84782	18.1S	70.3W	468	MS	86	0	0	0	1.2	4.6	4.8
85140	14.3S	67.4W	140	MS	62	0	0	0	1.0	7.7	7.8
85264	18.5S	64.1W	1998	S	58	58	100	0			
85312	19.8S	63.9W	992	S	43	0	0	0	1.5	-10.6	10.7
85406	18.3S	70.3W	55	M	123	0	0	0	1.0	4.3	4.4

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71060	52.5N	116.1W	230	MS	124	124	100	0			
71181	47.1N	55.3W	29	MS	124	0	0	0	0.7	-5.7	5.7
71581	54.5N	128.6W	215	MS	124	74	60	0	5.7	-8.0	9.8
76055	31.0N	114.9W	440	MS	63	63	100	0			
76225	28.6N	106.1W	1435	MS	86	1	1	0	0.8	-4.3	4.4
76382	25.5N	103.5W	1124	MS	83	0	0	0	0.8	4.3	4.4
76543	22.0N	98.8W	104	MS	68	0	0	1	1.1	9.3	9.4
76658	19.2N	103.7W	494	MS	49	2	4	4	0.6	5.7	5.7
76683	19.3N	98.3W	2248	MS	95	0	0	0	0.9	4.0	4.1
76762	17.5N	99.5W	1265	MS	83	0	0	0	0.7	6.1	6.1
76773	17.8N	97.8W	1650	MS	31	0	0	0	0.7	6.2	6.2
76843	16.8N	93.1W	528	MS	114	0	0	0	0.9	-5.1	5.2
78588	17.2N	87.5W	-257	M	122	122	100	0			

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	22	1	5	5	0.7	10.1	10.1
94130	14.8S	131.9E	120	MS	124	0	0	0	0.9	5.0	5.1

96505	3.7N	115.7E	-9999	8	35	35	100	0			
97284	8.6S	120.5E	1170	S8	81	0	0	0	0.6	4.4	4.4
97378	10.7S	123.1E	1	MS	48	47	98	0	0.0	-14.8	14.8

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	108	0	0	0	0.7	5.9	5.9
06239	54.9N	44.7E	49	MS	317	20	6	0	6.7	-1.6	6.9
06685	47.0N	9.1E	515	MS	124	0	0	3	1.1	5.8	5.9
06780	46.8N	9.8E	2690	S7	124	0	0	0	0.6	4.2	4.2
08922	42.8N	0.2W	1660	MS	42	42	100	0			
10850	48.8N	10.7E	457	MS	371	0	0	0	0.5	-5.2	5.2
11116	47.5N	10.8E	870	MS	62	0	0	0	0.8	4.4	4.5
13269	44.3N	19.9E	176	MS	121	0	0	0	0.8	7.9	7.9
14554	44.9N	18.4E	136	S	61	1	2	0	0.8	-13.2	13.2
16344	39.3N	16.4E	1710	S8	340	0	0	0	1.3	4.4	4.6
16450	37.6N	14.3E	940	S8	117	0	0	0	0.9	-7.0	7.1
16538	40.1N	9.3E	1022	S	41	0	0	5	2.2	8.8	9.1
17203	38.9N	40.5E	1177	S8	118	0	0	0	1.1	4.6	4.7
17521	35.2N	33.5E	285	MS	96	96	100	0			
40030	35.1N	36.8E	301	M	105	1	1	0	1.0	-4.8	4.9

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	122	0	0	1	1.5	-7.6	7.7
89257	75.4S	59.9W	40	S	648	0	0	0	1.5	-7.9	8.0
89266	72.2S	60.2W	91	S	301	300	100	0			
89512	70.8S	11.8E	140	MS	124	0	0	2	1.6	-4.5	4.8
89610	65.9S	113.1E	90	S	310	0	0	0	1.3	-9.6	9.7
89614	66.7S	111.5E	500	S	321	321	100	0			
89744	74.0S	43.1E	3353	S	335	0	0	0	0.7	7.1	7.1
89769	78.5S	168.4E	50	S	706	0	0	0	2.3	-5.6	6.1
89811	66.7S	112.8E	1366	S	329	0	0	0	1.4	-6.3	6.5
89868	79.9S	170.0E	60	S	348	0	0	0	1.6	-5.1	5.3

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3553	1	46	1.1	0.0	3520	0	46	0	5.3	0.3
AAL	5719	0	40	1.2	0.0	5340	0	42	0	5.7	0.3
AAR	980	0	7	1.7	-0.8	952	0	7	0	7.5	-0.5
ABD	31	0	10	1.4	-0.3	25	0	8	0	7.5	0.0
ACA	2357	1	10	1.5	0.0	1764	0	11	0	7.1	0.0
ACF	34	15	47	3.0	-0.1	21	0	67	0	16.6	0.4
ACI	109	0	5	0.9	0.2	109	0	5	0	5.3	-0.4
AEA	1597	0	3	1.4	0.2	1332	0	3	0	6.5	-0.3
AFL	625	0	3	1.6	0.2	343	0	3	0	7.3	0.8
AFR	1113	1	9	1.4	0.2	1069	0	9	0	7.2	0.2
AJM	189	0	5	1.7	-0.4	138	0	4	0	8.5	-0.5
AJX	295	0	4	1.3	0.5	294	1	5	0	7.0	-0.1
AME	27	0	11	2.0	-1.3	27	0	15	0	10.1	2.2
AMT	2248	0	44	1.1	0.2	2204	0	44	0	4.5	0.0
AMX	503	1	4	1.7	0.1	418	1	58	0	10.2	0.3
ANZ	6398	0	27	1.4	0.2	6395	0	27	0	7.2	0.4
ARG	46	4	41	2.9	0.8	38	0	37	0	7.6	0.6
ASY	28	0	32	1.3	0.5	27	0	30	0	5.4	1.8
ATN	95	1	100	3.7	-1.1	81	0	23	0	10.8	1.1
AVA	328	2	2	1.6	0.5	329	0	2	0	8.0	-0.5
AVN	144	0	47	1.2	0.3	147	1	48	0	8.9	-0.1
AZA	500	0	6	1.6	0.0	432	0	6	0	8.1	0.1
BAF	35	0	6	1.9	-0.8	26	0	8	0	9.8	-0.4
BAL	335	0	6	1.2	0.0	328	0	8	0	7.2	-0.2
BAW	426	1	21	2.0	-0.6	214	0	22	0	7.9	0.2
BBR	226	2	4	1.5	0.8	226	0	56	0	7.1	0.7
BMA	68	0	3	1.6	-0.2	28	0	4	0	6.3	-0.6
BPA	539	1	8	1.7	0.2	520	0	7	0	7.7	0.2
BWA	306	1	9	1.5	0.0	271	0	8	0	6.0	0.3
CAL	36	0	6	1.8	-0.3	36	0	8	0	8.6	0.3
CCA	388	1	18	2.5	0.3	395	1	100	0	12.3	-1.3
CES	507	1	7	1.6	0.0	501	0	7	0	8.3	-0.1
CFC	43	0	9	1.9	-0.1	46	0	13	0	8.3	0.6
CFG	798	1	6	1.4	0.2	659	0	5	0	7.3	-0.2
CKK	103	2	12	1.5	-0.3	109	0	12	0	9.8	-1.5
CKS	334	2	35	1.6	0.2	299	0	37	0	7.9	0.5
CLX	397	1	4	1.9	-0.5	207	0	5	0	6.8	0.3
CNJ	58591	0	77	1.1	0.5	58591	0	77	0	4.5	0.5
COA	227	0	26	1.3	0.0	177	0	28	0	7.1	0.4
CRL	585	1	5	1.6	0.1	538	0	4	0	8.7	0.1
CSA	38	3	13	1.6	-0.6	28	0	7	0	10.6	-0.8
CSN	115	2	16	1.9	0.1	115	3	15	0	9.2	1.2
CUB	153	2	6	2.3	0.8	138	0	7	0	10.3	0.4
DAL	3087	0	46	1.3	0.5	3021	0	47	0	5.0	0.0
DCS	52	0	8	1.7	-0.3	34	0	0	0	3.9	-0.1
DHL	110	5	100	6.8	-6.7	57	0	21	0	12.9	3.6
DLH	662	1	9	1.6	0.0	585	0	8	0	6.5	0.4
DRD	350	1	15	2.8	0.7	349	0	7	0	8.6	0.5
EDW	66	2	5	1.6	0.1	48	0	6	0	6.8	1.2
EEZ	102	0	4	1.8	0.3	103	1	3	0	6.1	1.1
EIA	379	2	18	1.6	0.0	362	0	100	0	18.3	5.7
ELY	76	0	4	1.7	-0.5	38	0	5	0	7.9	-0.5
ETH	21	0	14	1.0	-0.2	21	0	14	0	9.9	-1.0
EVA	149	1	5	1.7	-0.1	159	0	3	0	6.9	-0.2
FCA	160	1	4	1.4	0.2	127	0	55	0	5.8	-0.1
FDX	1823	0	53	1.3	0.2	1577	0	54	0	7.2	0.1
FIN	308	1	5	1.6	0.1	197	0	1	0	3.8	0.1

FJI	862	1	29	1.8	0.8	846	0	28	0	7.5	0.4
FOM	806	0	26	1.5	0.2	799	0	25	0	7.3	0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FWI	513	1	4	1.8	-0.2	501	0	3	0	7.5	0.6
GCO	117	1	12	1.5	0.0	118	0	100	0	11.6	1.8
GRL	69	0	0	1.4	0.1	59	0	0	0	4.1	0.7
GTI	212	1	15	2.5	1.1	196	0	8	0	5.9	0.3
HAL	4685	6	47	2.4	1.0	4604	0	41	0	6.4	0.2
HMY	61	2	33	1.4	0.1	61	0	33	0	6.0	0.3
IBE	3873	1	4	1.6	0.4	3819	0	4	0	7.7	0.3
ICE	1055	0	3	1.3	-0.1	554	0	3	0	5.7	1.0
ISR	62	5	8	1.9	0.0	31	0	0	0	6.7	0.4
IWD	642	0	4	1.7	0.0	637	0	3	0	6.5	0.5
JAL	1940	0	4	1.5	0.3	1930	0	5	0	7.1	0.1
JAZ	865	0	4	1.5	0.8	863	0	4	0	6.9	0.0
JBU	25	0	0	0.5	0.0	28	0	0	0	5.8	-0.4
KAL	1413	0	6	1.6	0.0	1410	0	7	0	8.1	-0.4
KLM	1516	0	7	1.6	-0.1	1136	0	8	0	7.2	0.0
LAN	638	0	2	1.7	-0.3	633	0	1	0	5.7	0.5
LAP	57	0	47	3.0	1.5	55	2	44	0	10.5	2.5
LDI	282	2	7	1.8	0.0	221	0	5	0	7.5	1.2
LNE	132	3	5	1.3	0.1	129	0	2	0	8.3	-0.5
LOT	447	0	4	1.8	0.0	256	0	3	0	6.9	0.3
LTU	726	1	6	1.6	-0.1	589	0	5	0	6.7	0.4
LXR	62	2	6	1.3	-0.1	57	0	4	0	4.8	-0.7
MAS	315	0	5	1.4	-0.1	295	0	6	0	7.3	-0.7
MAU	26	8	62	1.3	1.0	24	0	67	0	10.7	-0.2
MMZ	42	0	100	3.1	1.2	42	0	10	0	15.6	-1.9
MPD	458	1	5	1.9	0.6	438	0	3	0	7.4	0.1
MPH	544	1	6	1.8	-0.4	377	0	6	0	7.8	-0.4
MXA	63	2	14	2.4	-0.4	64	0	100	0	15.8	-0.1
MYT	327	0	5	1.5	0.0	221	0	2	0	5.1	0.5
NAO	386	0	42	1.0	-0.2	384	0	42	0	5.5	0.4
NCA	891	0	3	1.6	-0.1	678	0	3	0	6.8	-0.4
NWA	8639	1	16	1.7	0.1	8349	0	16	0	8.0	-0.1
NZL	3157	0	6	1.1	0.0	3157	0	6	0	5.1	0.3
OAE	505	0	27	1.3	-0.3	417	0	31	0	7.1	0.6
OOM	167	0	4	1.7	-0.6	102	0	7	0	6.5	0.4
PAC	423	0	6	1.5	-0.4	391	0	6	0	7.2	-0.5
PAL	1502	1	9	1.3	-0.1	1449	0	9	0	7.8	0.0
PAO	315	1	54	1.1	0.3	314	0	54	0	9.6	0.1
PBI	720	0	33	1.4	0.1	720	0	34	0	6.7	0.6
PLM	311	1	6	2.2	1.5	259	0	5	0	7.7	-0.6
PUA	22	9	55	2.1	-0.8	20	0	65	0	16.3	-0.5
QFA	4303	0	37	1.4	0.3	4284	0	36	0	6.4	0.1
QQA	42	0	45	0.7	-0.1	42	2	48	0	3.8	-0.9
RAM	391	0	4	1.7	0.3	311	1	5	0	9.1	0.2
RCH	330	3	100	3.0	-0.5	221	0	100	0	13.7	1.8
RRR	108	5	7	1.8	-0.1	104	0	7	0	7.5	0.5
RYN	256	0	42	1.1	-0.1	251	0	42	0	5.7	-0.1
RZO	841	2	6	1.7	-0.5	807	0	4	0	7.4	0.2
SAA	29	0	0	0.9	0.1	30	0	10	0	13.8	2.0
SEU	149	1	8	1.5	-0.2	125	0	7	0	9.5	-0.1
SIA	462	0	4	1.5	0.6	461	0	4	0	5.4	0.2
SLM	155	0	3	1.1	0.5	152	0	5	0	9.1	-0.4
SQC	47	0	4	1.1	-0.2	47	0	4	0	6.7	1.2
SSV	65	0	5	1.8	0.4	24	0	0	0	6.5	0.3
SVH	55	0	9	1.3	0.9	55	0	9	0	4.9	0.3
TAG	31	0	26	2.1	-0.8	25	0	28	0	4.5	0.6
TAM	32	6	56	3.4	0.9	31	10	55	0	14.5	0.3

TAP	713	0	3	1.4	-0.3	662	1	5	0	7.9	0.1
TCX	147	0	5	1.6	0.1	73	0	8	0	8.7	-0.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TFL	216	0	3	1.2	-0.1	177	0	4	0	9.2	0.1
THA	296	0	3	1.4	0.3	296	0	3	0	5.5	0.8
THT	984	0	22	1.1	0.6	983	0	22	0	5.8	1.0
TPA	34	0	12	1.0	0.1	28	0	7	0	6.4	-0.5
TSC	269	0	3	1.7	-0.5	161	0	1	0	5.2	0.2
TSO	29	0	7	2.1	-1.4	23	0	0	0	6.0	1.0
TUB	124	0	3	1.6	-0.5	53	0	6	0	11.4	-1.7
UAE	703	0	5	1.4	0.4	702	0	5	0	4.8	0.1
UAL	7360	0	55	1.0	0.1	7353	0	54	0	5.3	0.2
UPS	1481	0	59	1.4	0.2	1427	0	59	0	6.6	0.1
USA	70	0	4	1.6	0.2	67	0	1	0	5.2	0.0
UTY	43	5	47	0.9	-0.3	43	5	47	0	4.7	-0.3
VHF	33	3	3	1.1	0.3	35	0	0	0	5.3	0.3
VHO	22	9	41	2.7	0.5	22	0	36	0	11.0	2.9
VIR	47	0	6	1.3	0.1	26	0	4	0	4.6	1.0
VRG	77	4	35	2.5	0.8	74	1	100	0	11.2	1.7
VVJ	23	0	4	2.0	0.1	24	0	0	0	7.3	1.8
VVR	60	3	42	2.0	0.8	58	0	43	0	6.6	0.2
WOA	345	1	8	1.5	0.3	297	0	8	0	8.3	0.5
XLA	156	1	5	1.8	0.4	141	0	6	0	9.1	0.9
YSS	58	0	2	1.6	-0.6	58	0	5	0	9.6	0.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	42928	0	16	1.2	0.6	42929	0	16	0	5.3	0.6
B-	3908	0	79	1.7	0.9	3908	0	77	0	5.8	0.1
CA	2964	0	74	1.8	1.1	2811	0	74	0	6.1	0.1
EU	237511	0	28	1.2	0.3	237510	0	27	0	4.3	0.2
HK	4091	0	23	1.2	0.3	4091	0	23	0	4.9	0.2
JP	60122	0	63	1.4	0.6	60122	0	62	0	5.3	0.3
LN	24	0	54	0.8	-0.4	24	0	63	0	11.4	-1.4
MK	2710	0	5	2.2	2.0	2706	0	5	0	6.8	1.6
SA	5463	0	8	1.2	0.7	5463	0	8	0	5.8	0.5
TN	81	2	30	2.5	0.9	83	0	25	0	6.5	-0.6
UA	317708	0	98	1.1	-0.2	317571	0	98	0	4.8	0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	855	2	24	2.1	0.4	652	0	28	0	8.1	0.5
U	1153261	0	67	1.3	0.3	1153244	0	67	0	5.1	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

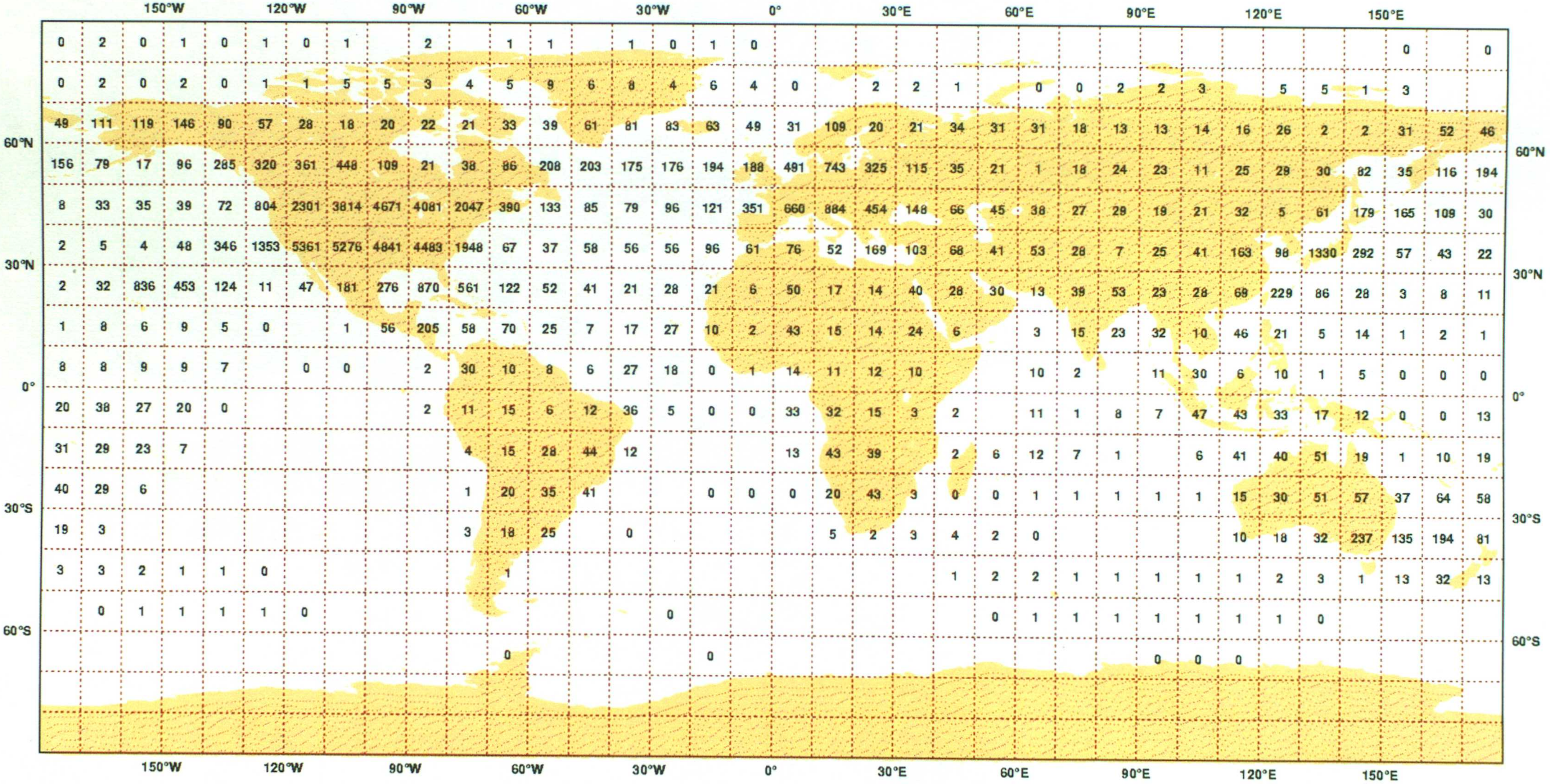
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	195	2	46	1.4	-0.2	184	0	45	0	6.3	1.8
ACA	80	4	24	1.2	0.1	71	0	24	0	5.8	0.2
AFR	41	0	22	2.3	0.2	43	0	19	0	8.0	-0.9
AMT	53	0	25	1.6	0.4	51	0	24	0	5.0	0.6
ANZ	355	1	30	1.5	-0.2	357	1	30	0	7.6	-0.7
AXF	64	0	52	2.1	-0.5	62	0	52	0	10.5	0.5
BAF	44	0	5	1.6	0.3	28	0	4	0	5.0	-0.6
BAL	30	0	0	0.8	0.0	29	0	0	0	6.6	1.0
CFC	59	0	2	1.1	0.3	51	0	4	0	6.2	0.2
CKS	67	0	27	1.2	0.3	48	0	38	0	5.6	-0.7
CNJ	599864	0	84	1.8	0.8	599864	0	84	0	4.9	0.2
CWC	72	0	11	2.5	0.6	36	0	33	0	16.8	4.2
DAL	58	0	28	2.4	-0.7	56	0	29	0	8.9	0.4
DLH	199	0	7	1.2	0.0	194	0	10	0	9.3	0.1
FDX	471	0	37	1.5	0.3	315	0	35	0	7.5	0.5
FJI	20	10	45	2.4	0.9	20	0	35	0	7.7	-3.3
GCO	45	0	9	1.1	0.1	45	0	100	0	9.6	2.3
HAL	386	1	48	3.0	0.7	385	0	43	0	6.8	1.3
IBE	30	3	10	1.3	0.3	30	0	10	0	8.4	1.2
JAL	31	0	0	1.4	0.7	30	0	3	0	6.1	0.2
JAZ	33	0	3	1.3	0.8	33	0	9	0	4.4	-0.5
KAL	54	0	13	1.5	-0.3	53	0	13	0	7.2	0.3
KIW	37	5	43	3.0	2.4	39	0	41	0	6.3	0.7
LAN	63	6	16	1.4	0.2	56	0	11	0	7.8	0.4
MAS	40	0	10	1.0	0.0	39	0	10	0	6.0	0.3
NCA	60	0	8	2.0	-0.8	51	0	12	0	7.6	-0.8
NWA	199	3	16	1.8	0.3	182	0	14	0	7.2	0.5
NZL	9679	0	50	1.1	0.2	9676	0	50	0	4.7	0.2
OAE	42	0	2	1.4	-0.1	29	0	3	0	7.0	0.8
OCE	26	0	4	3.1	2.8	25	0	0	0	5.3	0.6
PAC	52	0	6	1.9	0.1	36	0	6	0	8.1	0.3
PAL	28	0	4	1.2	0.2	27	0	4	0	5.7	-0.9
QFA	197	0	47	1.1	0.4	196	0	47	0	5.9	-0.2
RCH	50	16	100	3.9	0.0	35	3	100	0	12.2	0.0
RRR	100	1	26	3.9	2.1	98	1	15	0	9.4	0.6
SIA	77	0	1	1.2	0.6	79	0	1	0	4.9	1.4
SVH	2900	0	58	1.4	0.7	2900	0	58	0	4.4	0.5
THA	23	0	0	1.0	0.7	22	0	0	0	4.1	1.0
THT	41	0	68	1.4	-0.4	41	0	68	0	16.0	2.9
UAE	83	0	5	1.0	0.6	84	0	5	0	5.0	0.3
UAL	107	1	36	1.3	0.2	109	0	34	0	7.1	-0.5
UPS	278	1	53	1.4	0.0	259	1	54	0	8.3	0.2
VVP	45	9	62	4.1	2.9	44	0	59	0	15.3	1.5
WOA	88	1	5	1.2	0.6	62	0	29	0	14.3	2.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	54678	0	61	1.2	0.6	54676	0	61	0	3.9	0.3
B-	20841	0	80	1.3	0.2	20841	0	78	0	4.7	0.3
CA	21447	0	78	1.2	0.1	20945	0	78	0	4.5	0.3
CZ	127	0	30	0.8	-0.1	20	55	90	0	33.0	20.6
EU	715237	0	70	1.0	0.2	710813	0	70	0	3.6	0.0
HK	4031	0	73	1.2	0.3	4031	0	73	0	4.2	0.3
JP	289719	0	82	1.3	0.3	289719	0	81	0	4.2	0.6
MK	3018	0	50	1.3	0.7	2994	0	50	0	4.6	0.7
SA	4160	0	57	1.3	0.2	4160	0	57	0	4.3	0.3
UA	252255	0	99	1.0	-0.2	252019	0	99	0	3.8	0.4

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
U	1600406	0	79	1.1	0.3	1595264	0	79	0	3.9	0.3

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 63992



0	2	0	1	0	1	0	1		2		1	1		1	0	1	0																0		0
0	2	0	2	0	1	1	5	5	3	4	5	9	6	8	4	6	4	0		2	2	1		0	0	2	2	3		5	5	1	3		
49	111	119	146	90	57	28	18	20	22	21	33	39	61	81	83	63	49	31	109	20	21	34	31	31	18	13	13	14	16	26	2	2	31	52	46
156	79	17	96	285	320	361	448	109	21	38	86	208	203	175	176	194	188	491	743	325	115	35	21	1	18	24	23	11	25	28	30	82	35	116	194
8	33	35	39	72	804	2301	3814	4671	4081	2047	390	133	85	79	96	121	351	660	884	454	148	66	45	38	27	29	19	21	32	5	61	179	165	109	30
2	5	4	48	346	1353	5361	5276	4841	4483	1948	67	37	58	56	56	96	61	76	52	169	103	68	41	53	28	7	25	41	163	98	1330	292	57	43	22
2	32	836	453	124	11	47	181	276	870	561	122	52	41	21	28	21	6	50	17	14	40	28	30	13	39	53	23	28	69	229	86	28	3	8	11
1	8	6	9	5	0		1	56	205	58	70	25	7	17	27	10	2	43	15	14	24	6		3	15	23	32	10	46	21	5	14	1	2	1
8	8	9	9	7		0	0		2	30	10	8	6	27	18	0	1	14	11	12	10			10	2		11	30	6	10	1	5	0	0	0
20	38	27	20	0					2	11	15	6	12	36	5	0	0	33	32	15	3	2		11	1	8	7	47	43	33	17	12	0	0	13
31	29	23	7							4	15	28	44	12				13	43	39		2	6	12	7	1		6	41	40	51	19	1	10	19
40	29	6								1	20	35	41			0	0	0	20	43	3	0	0	1	1	1	1	1	15	30	51	57	37	64	58
19	3									3	18	25		0					5	2	3	4	2	0					10	18	32	237	135	194	81
3	3	2	1	1	0						1											1	2	2	1	1	1	1	1	2	3	1	13	32	13
	0	1	1	1	1	0									0								0	1	1	1	1	1	1	1	0				
											0					0											0	0	0						

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 115212

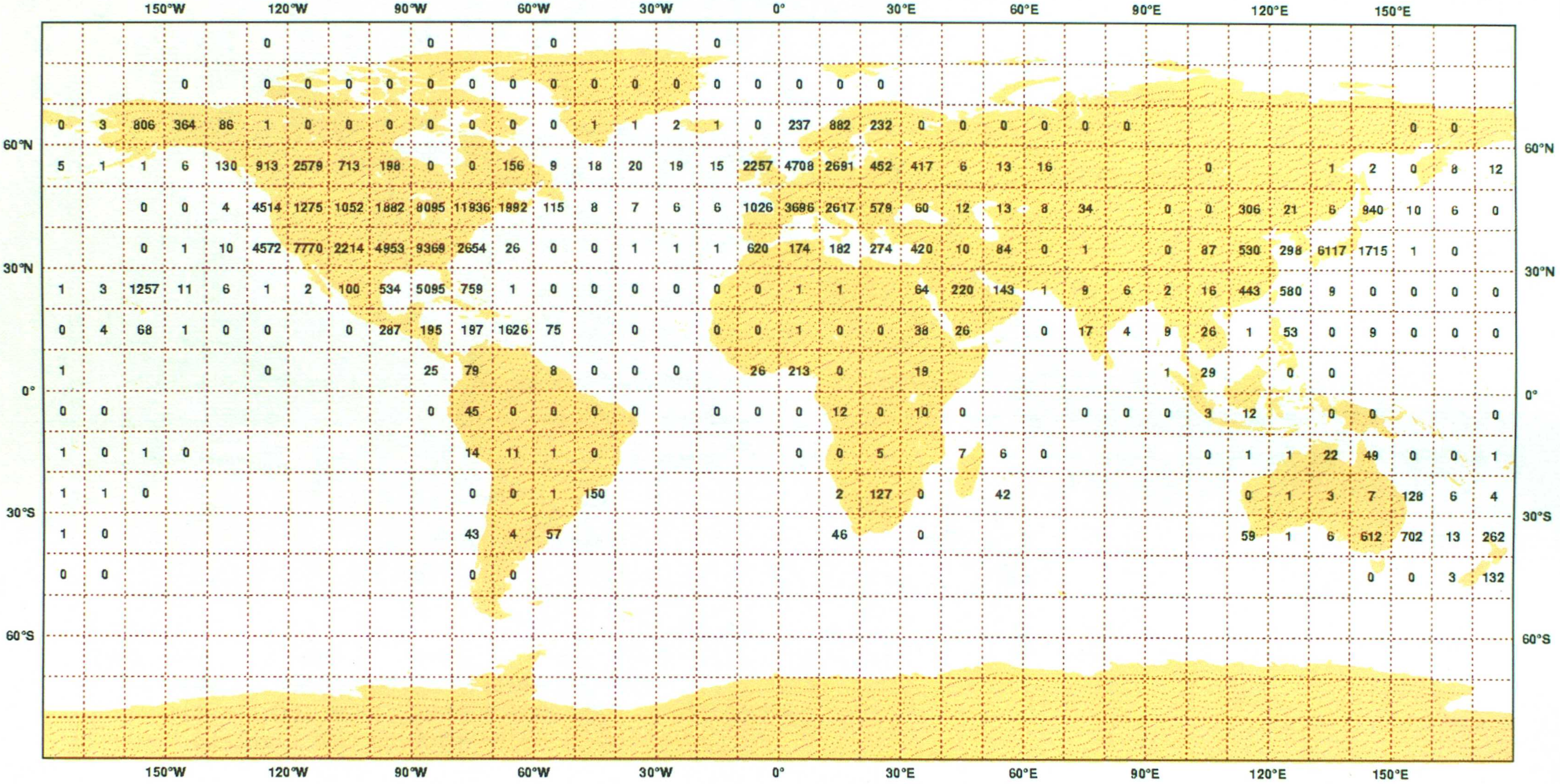

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 3 806 364 86 1 0 0 0 0 0 0 0 1 1 2 1 0 237 882 232 0 0 0 0 0 0 0 0
5 1 1 6 130 913 2579 713 198 0 0 156 9 18 20 19 15 2257 4708 2691 452 417 6 13 16 0 1 2 0 8 12
0 0 4 4514 1275 1052 1882 8095 11936 1992 115 8 7 6 6 1026 3696 2617 579 60 12 13 8 34 0 0 306 21 6 940 10 6 0
0 1 10 4572 7770 2214 4953 9369 2654 26 0 0 1 1 1 620 174 182 274 420 10 84 0 1 0 87 530 298 6117 1715 1 0
1 3 1257 11 6 1 2 100 534 5095 759 1 0 0 0 0 0 0 1 1 64 220 143 1 9 6 2 16 443 580 9 0 0 0 0
0 4 68 1 0 0 0 287 195 197 1626 75 0 0 0 1 0 0 38 26 0 17 4 9 26 1 53 0 9 0 0 0
1 0 25 79 8 0 0 0 26 213 0 19 1 29 0 0
0 0 0 45 0 0 0 0 0 0 0 12 0 10 0 0 0 0 3 12 0 0 0
1 0 1 0 14 11 1 0 0 0 5 7 6 0 0 1 1 22 49 0 0 1
1 1 0 0 0 1 150 2 127 0 42 0 1 3 7 128 6 4
1 0 43 4 57 46 0 59 1 6 612 702 13 262
0 0 0 0 0 0 3 132

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

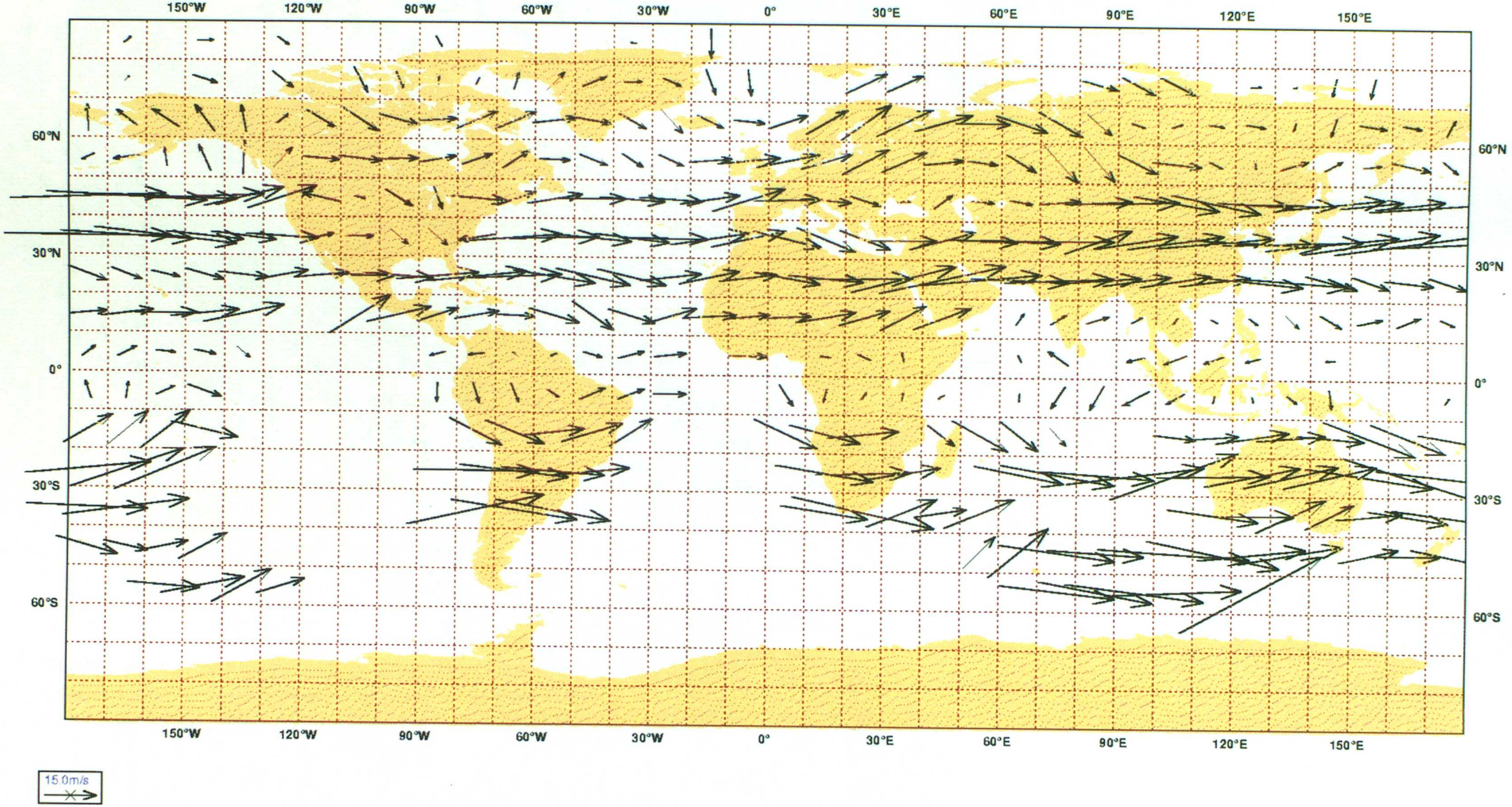

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

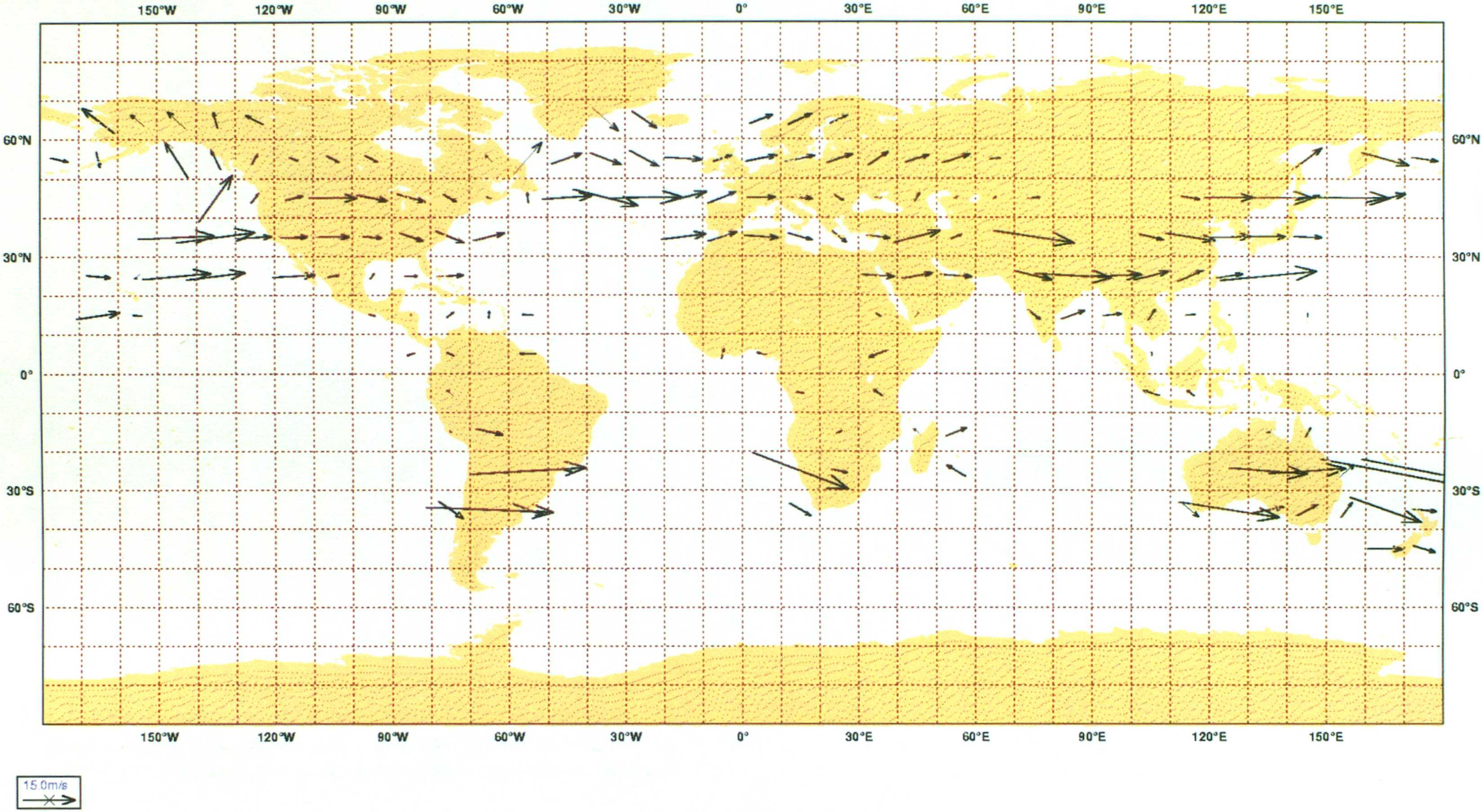

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

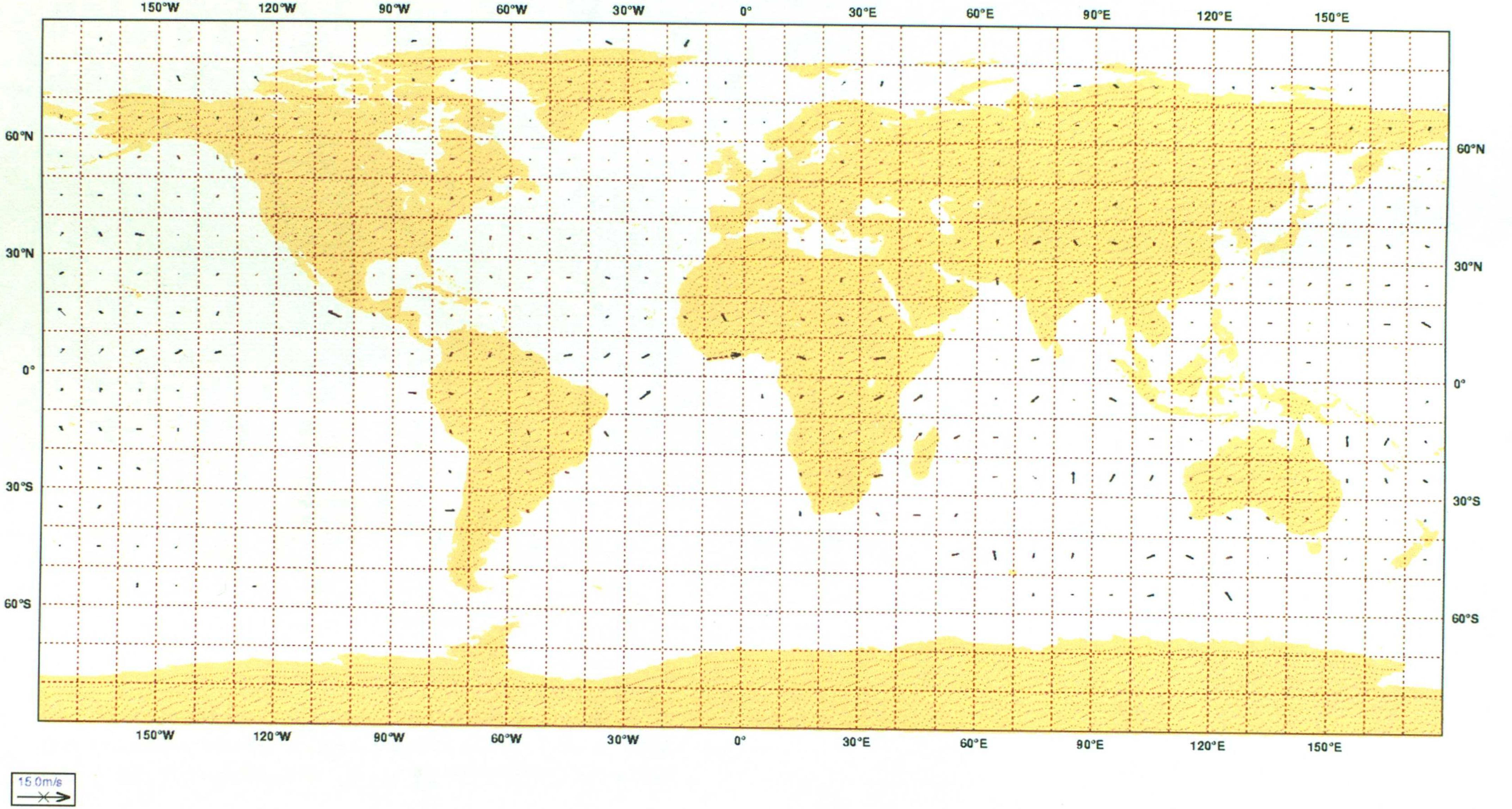

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

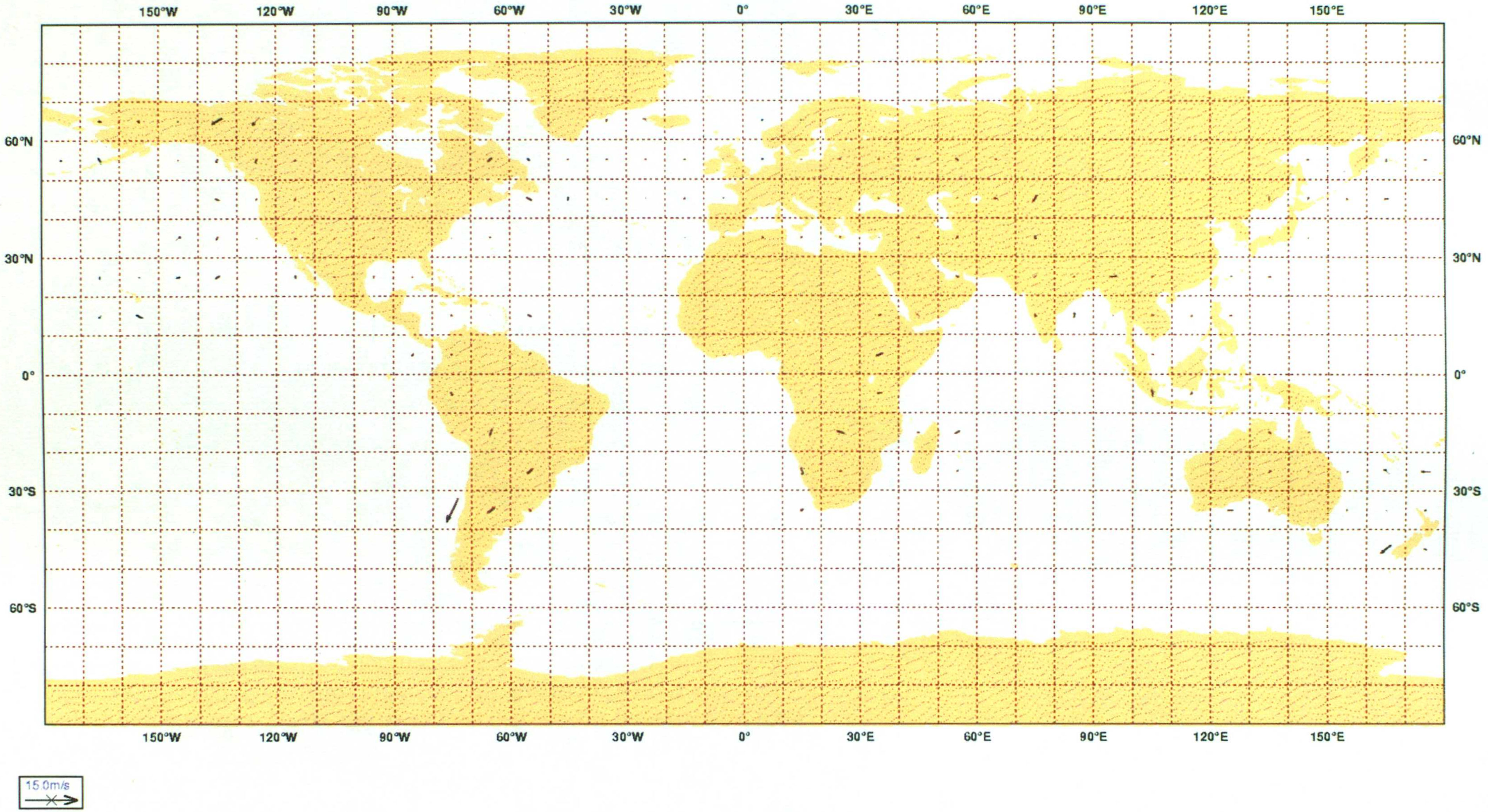

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

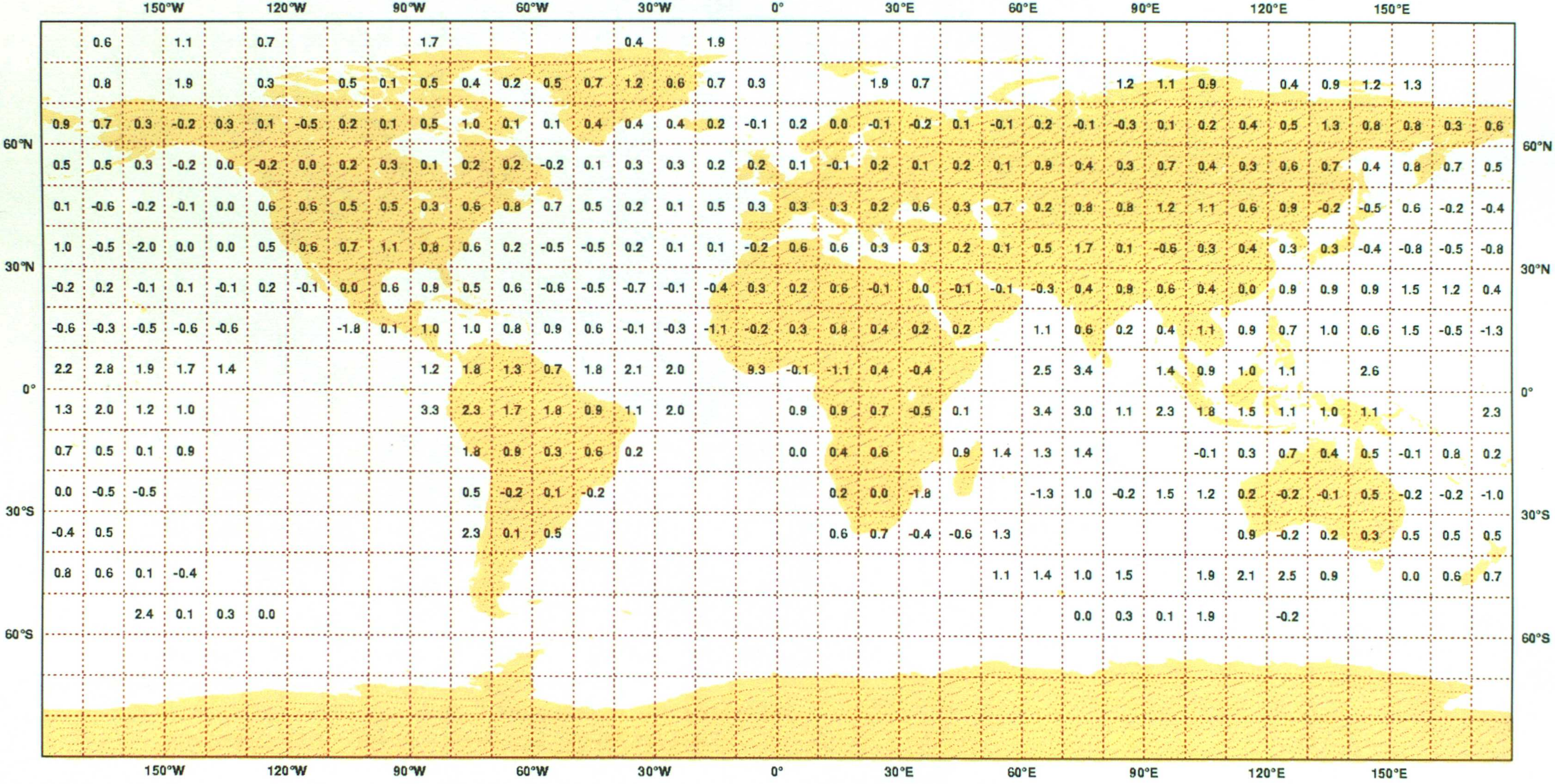

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.6 1.1 0.7 1.7 0.4 1.9
0.8 1.9 0.3 0.5 0.1 0.5 0.4 0.2 0.5 0.7 1.2 0.6 0.7 0.3 1.9 0.7 1.2 1.1 0.9 0.4 0.9 1.2 1.3
0.9 0.7 0.3 -0.2 0.3 0.1 -0.5 0.2 0.1 0.5 1.0 0.1 0.1 0.4 0.4 0.4 0.2 -0.1 0.2 0.0 -0.1 -0.2 0.1 -0.1 0.2 -0.1 -0.3 0.1 0.2 0.4 0.5 1.3 0.8 0.8 0.3 0.6
0.5 0.5 0.3 -0.2 0.0 -0.2 0.0 0.2 0.3 0.1 0.2 0.2 -0.2 0.1 0.3 0.3 0.2 0.2 0.1 -0.1 0.2 0.1 0.2 0.1 0.9 0.4 0.3 0.7 0.4 0.3 0.6 0.7 0.4 0.8 0.7 0.5
0.1 -0.6 -0.2 -0.1 0.0 0.6 0.6 0.5 0.5 0.3 0.6 0.8 0.7 0.5 0.2 0.1 0.5 0.3 0.3 0.3 0.2 0.6 0.3 0.7 0.2 0.8 0.8 1.2 1.1 0.6 0.9 -0.2 -0.5 0.6 -0.2 -0.4
1.0 -0.5 -2.0 0.0 0.0 0.5 0.6 0.7 1.1 0.8 0.6 0.2 -0.5 -0.5 0.2 0.1 0.1 -0.2 0.6 0.6 0.3 0.3 0.2 0.1 0.5 1.7 0.1 -0.6 0.3 0.4 0.3 0.3 -0.4 -0.8 -0.5 -0.8
-0.2 0.2 -0.1 0.1 -0.1 0.2 -0.1 0.0 0.6 0.9 0.5 0.6 -0.6 -0.5 -0.7 -0.1 -0.4 0.3 0.2 0.6 -0.1 0.0 -0.1 -0.1 -0.3 0.4 0.9 0.6 0.4 0.0 0.9 0.9 0.9 1.5 1.2 0.4
-0.6 -0.3 -0.5 -0.6 -0.6 -1.8 0.1 1.0 1.0 0.8 0.9 0.6 -0.1 -0.3 -1.1 -0.2 0.3 0.8 0.4 0.2 0.2 1.1 0.6 0.2 0.4 1.1 0.9 0.7 1.0 0.6 1.5 -0.5 -1.3
2.2 2.8 1.9 1.7 1.4 1.2 1.8 1.3 0.7 1.8 2.1 2.0 9.3 -0.1 -1.1 0.4 -0.4 2.5 3.4 1.4 0.9 1.0 1.1 2.6
1.3 2.0 1.2 1.0 3.3 2.3 1.7 1.8 0.9 1.1 2.0 0.9 0.9 0.7 -0.5 0.1 3.4 3.0 1.1 2.3 1.8 1.5 1.1 1.0 1.1 2.3
0.7 0.5 0.1 0.9 1.8 0.9 0.3 0.6 0.2 0.0 0.4 0.6 0.9 1.4 1.3 1.4 -0.1 0.3 0.7 0.4 0.5 -0.1 0.8 0.2
0.0 -0.5 -0.5 0.5 -0.2 0.1 -0.2 0.2 0.0 -1.8 -1.3 1.0 -0.2 1.5 1.2 0.2 -0.2 -0.1 0.5 -0.2 -0.2 -1.0
-0.4 0.5 2.3 0.1 0.5 0.6 0.7 -0.4 -0.6 1.3 0.9 -0.2 0.2 0.3 0.5 0.5 0.5
0.8 0.6 0.1 -0.4 1.1 1.4 1.0 1.5 1.9 2.1 2.5 0.9 0.0 0.6 0.7
2.4 0.1 0.3 0.0 0.0 0.3 0.1 1.9 -0.2

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

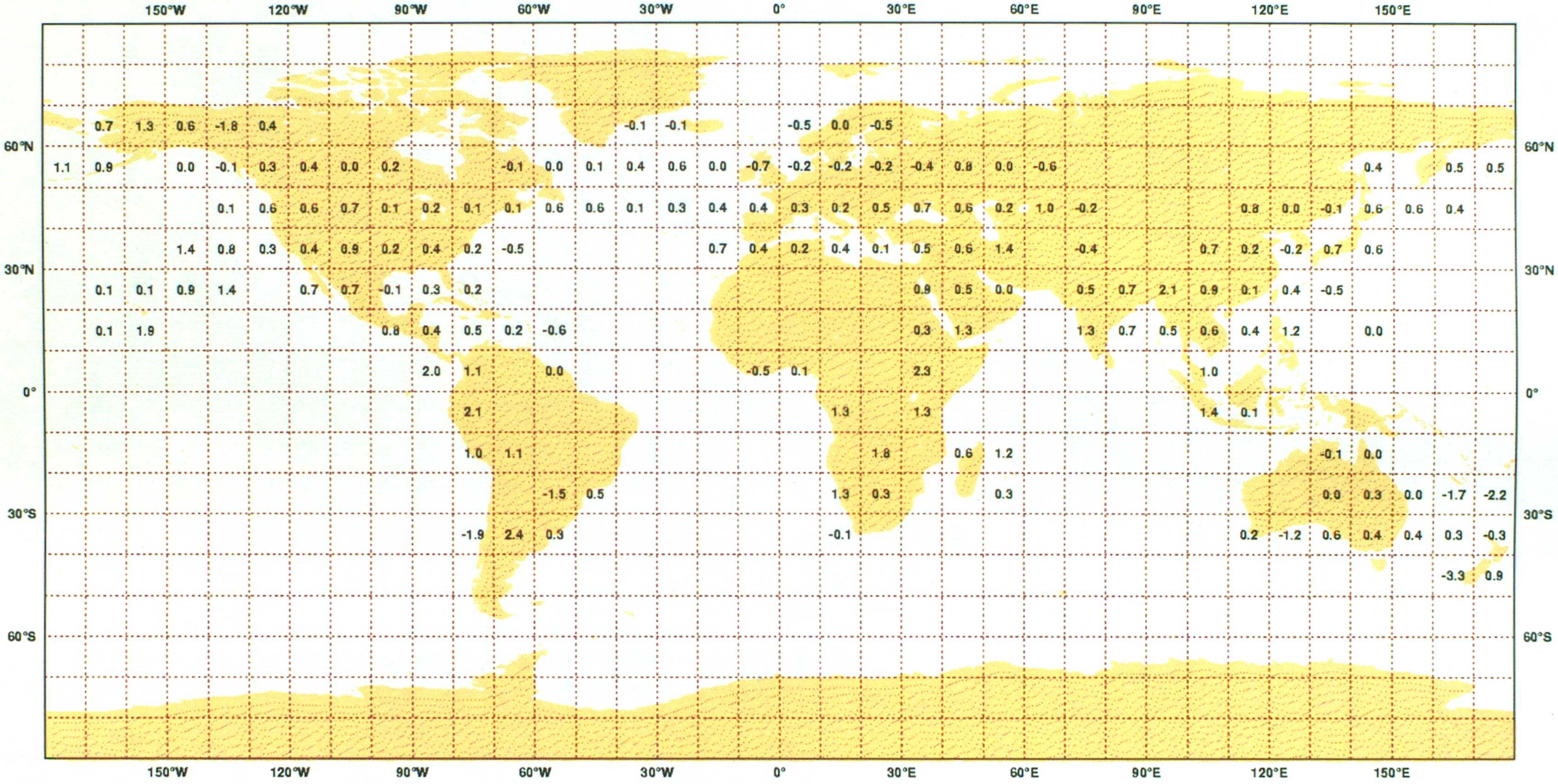
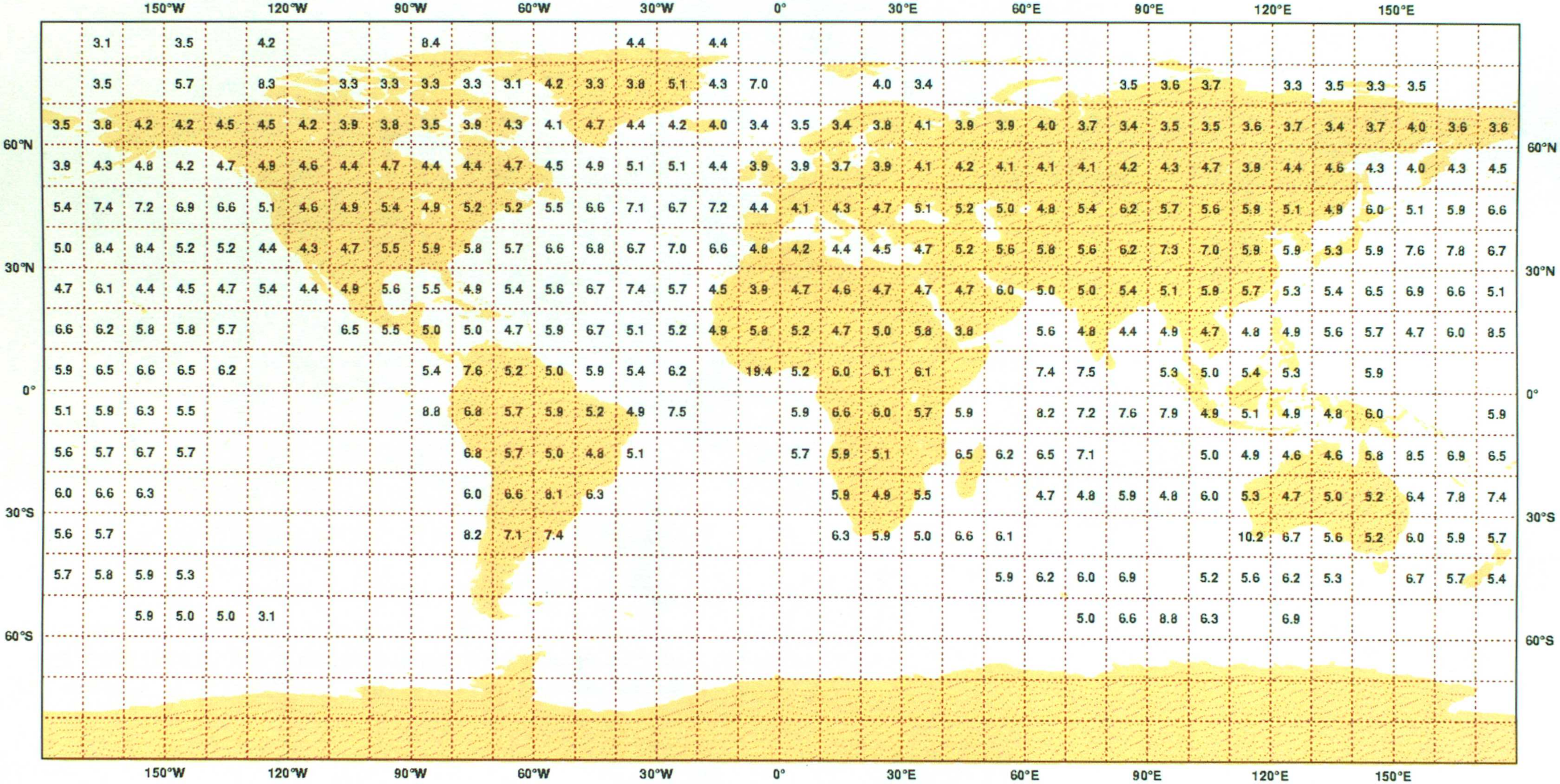

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0.7 1.3 0.6 -1.8 0.4 -0.1 -0.1 -0.5 0.0 -0.5
1.1 0.9 0.0 -0.1 0.3 0.4 0.0 0.2 -0.1 0.0 0.1 0.4 0.6 0.0 -0.7 -0.2 -0.2 -0.2 -0.4 0.8 0.0 -0.6 0.4 0.5 0.5
0.1 0.6 0.6 0.7 0.1 0.2 0.1 0.1 0.6 0.6 0.1 0.3 0.4 0.4 0.3 0.2 0.5 0.7 0.6 0.2 1.0 -0.2 0.8 0.0 -0.1 0.6 0.6 0.4
1.4 0.8 0.3 0.4 0.9 0.2 0.4 0.2 -0.5 0.7 0.4 0.2 0.4 0.1 0.5 0.6 1.4 -0.4 0.7 0.2 -0.2 0.7 0.6
0.1 0.1 0.9 1.4 0.7 0.7 -0.1 0.3 0.2 0.9 0.5 0.0 0.5 0.7 2.1 0.9 0.1 0.4 -0.5
0.1 1.9 0.8 0.4 0.5 0.2 -0.6 0.3 1.3 1.3 0.7 0.5 0.6 0.4 1.2 0.0
2.0 1.1 0.0 -0.5 0.1 2.3 1.0
2.1 1.3 1.3 1.4 0.1
1.0 1.1 1.8 0.6 1.2 -0.1 0.0
-1.5 0.5 1.3 0.3 0.3 0.0 0.3 0.0 -1.7 -2.2
-1.9 2.4 0.3 -0.1 0.2 -1.2 0.6 0.4 0.4 0.3 -0.3
-3.3 0.9

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present



	3.1		3.5		4.2				8.4					4.4		4.4																			
	3.5		5.7		8.3		3.3	3.3	3.3	3.3	3.1	4.2	3.3	3.8	5.1	4.3	7.0			4.0	3.4					3.5	3.6	3.7		3.3	3.5	3.3	3.5		
3.5	3.8	4.2	4.2	4.5	4.5	4.2	3.9	3.8	3.5	3.9	4.3	4.1	4.7	4.4	4.2	4.0	3.4	3.5	3.4	3.8	4.1	3.9	3.9	4.0	3.7	3.4	3.5	3.5	3.6	3.7	3.4	3.7	4.0	3.6	3.6
3.9	4.3	4.8	4.2	4.7	4.9	4.6	4.4	4.7	4.4	4.4	4.7	4.5	4.9	5.1	5.1	4.4	3.9	3.9	3.7	3.9	4.1	4.2	4.1	4.1	4.1	4.2	4.3	4.7	3.9	4.4	4.6	4.3	4.0	4.3	4.5
5.4	7.4	7.2	6.9	6.6	5.1	4.6	4.9	5.4	4.9	5.2	5.2	5.5	6.6	7.1	6.7	7.2	4.4	4.1	4.3	4.7	5.1	5.2	5.0	4.8	5.4	6.2	5.7	5.6	5.9	5.1	4.9	6.0	5.1	5.9	6.6
5.0	8.4	8.4	5.2	5.2	4.4	4.3	4.7	5.5	5.9	5.8	5.7	6.6	6.8	6.7	7.0	6.6	4.8	4.2	4.4	4.5	4.7	5.2	5.6	5.8	5.6	6.2	7.3	7.0	5.9	5.9	5.3	5.9	7.6	7.8	6.7
4.7	6.1	4.4	4.5	4.7	5.4	4.4	4.9	5.6	5.5	4.9	5.4	5.6	6.7	7.4	5.7	4.5	3.9	4.7	4.6	4.7	4.7	4.7	6.0	5.0	5.0	5.4	5.1	5.9	5.7	5.3	5.4	6.5	6.9	6.6	5.1
6.6	6.2	5.8	5.8	5.7			6.5	5.5	5.0	5.0	4.7	5.9	6.7	5.1	5.2	4.9	5.8	5.2	4.7	5.0	5.8	3.8		5.6	4.8	4.4	4.9	4.7	4.8	4.9	5.6	5.7	4.7	6.0	8.5
5.9	6.5	6.6	6.5	6.2					5.4	7.6	5.2	5.0	5.9	5.4	6.2		19.4	5.2	6.0	6.1	6.1			7.4	7.5		5.3	5.0	5.4	5.3		5.9			
5.1	5.9	6.3	5.5						8.8	6.8	5.7	5.9	5.2	4.9	7.5			5.9	6.6	6.0	5.7	5.9		8.2	7.2	7.6	7.9	4.9	5.1	4.9	4.8	6.0			5.9
5.6	5.7	6.7	5.7							6.8	5.7	5.0	4.8	5.1				5.7	5.9	5.1		6.5	6.2	6.5	7.1			5.0	4.9	4.6	4.6	5.8	8.5	6.9	6.5
6.0	6.6	6.3								6.0	6.6	8.1	6.3						5.9	4.9	5.5			4.7	4.8	5.9	4.8	6.0	5.3	4.7	5.0	5.2	6.4	7.8	7.4
5.6	5.7									8.2	7.1	7.4							6.3	5.9	5.0	6.6	6.1						10.2	6.7	5.6	5.2	6.0	5.9	5.7
5.7	5.8	5.9	5.3																				5.9	6.2	6.0	6.9		5.2	5.6	6.2	5.3		6.7	5.7	5.4
		5.9	5.0	5.0	3.1																				5.0	6.6	8.8	6.3		6.9					

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). MAY 2005
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

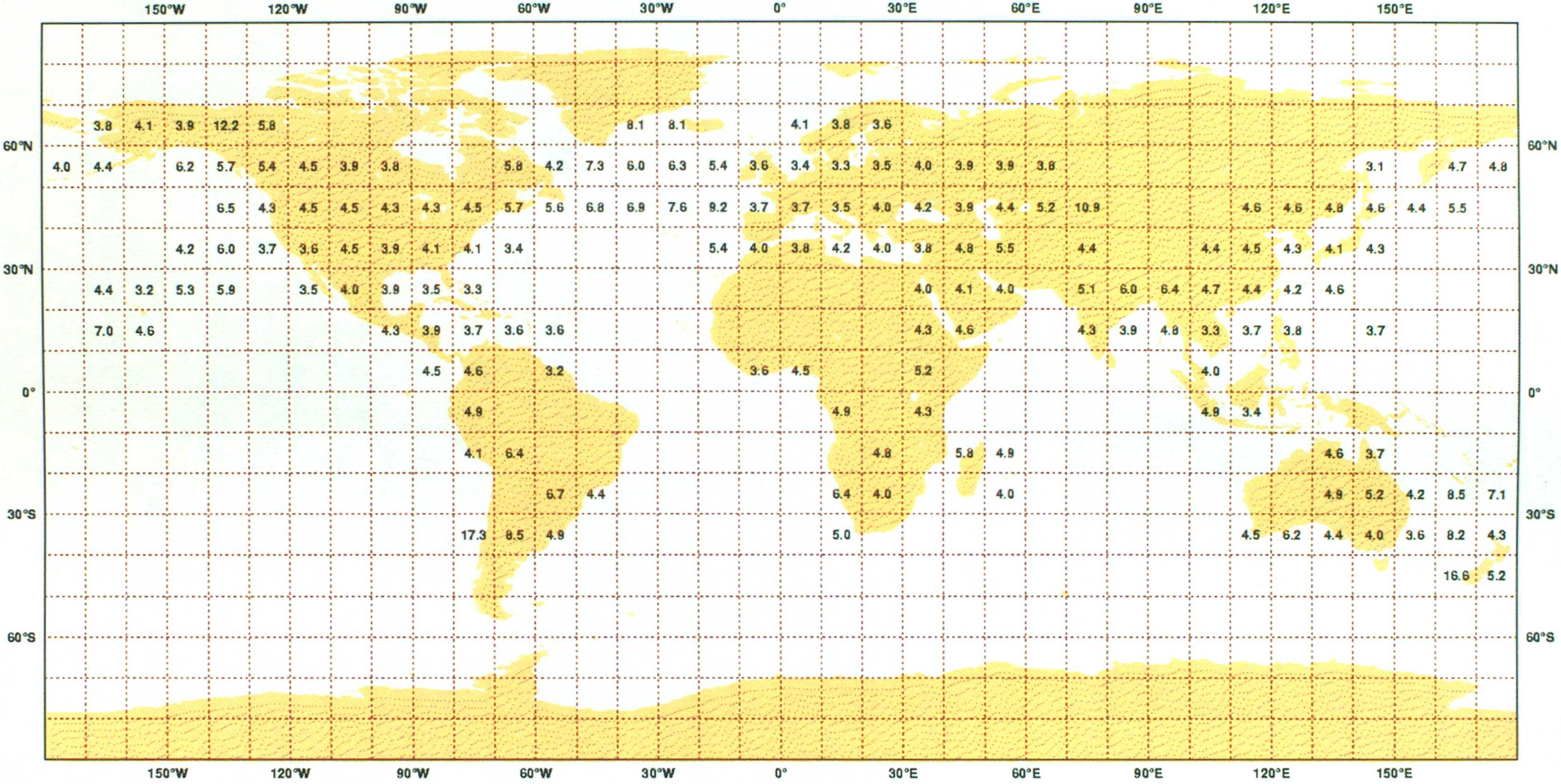

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.8 4.1 3.9 12.2 5.8 8.1 8.1 4.1 3.8 3.6
4.0 4.4 6.2 5.7 5.4 4.5 3.9 3.8 5.8 4.2 7.3 6.0 6.3 5.4 3.6 3.4 3.3 3.5 4.0 3.9 3.9 3.8 3.1 4.7 4.8
6.5 4.3 4.5 4.5 4.3 4.3 4.5 5.7 5.6 6.8 6.9 7.6 9.2 3.7 3.7 3.5 4.0 4.2 3.9 4.4 5.2 10.9 4.6 4.6 4.8 4.6 4.4 5.5
4.2 6.0 3.7 3.6 4.5 3.9 4.1 4.1 3.4 5.4 4.0 3.8 4.2 4.0 3.8 4.8 5.5 4.4 4.4 4.5 4.3 4.1 4.3
4.4 3.2 5.3 5.9 3.5 4.0 3.9 3.5 3.3 4.0 4.1 4.0 5.1 6.0 6.4 4.7 4.4 4.2 4.6
7.0 4.6 4.3 3.9 3.7 3.6 3.6 4.3 4.6 4.3 3.9 4.8 3.3 3.7 3.8 3.7
4.5 4.6 3.2 3.6 4.5 5.2 4.0
4.9 4.9 4.3 4.9 3.4
4.1 6.4 4.8 5.8 4.9 4.6 3.7
6.7 4.4 6.4 4.0 4.0 4.9 5.2 4.2 8.5 7.1
17.3 8.5 4.9 5.0 4.5 6.2 4.4 4.0 3.6 8.2 4.3
16.6 5.2

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
28275	12	Z	250	58/ 68	21	0	38.2	67.9	77.9	4
31168	00	Z	70	56/ 138	24	0	81.7	192.6	209.2	8
42101	00	Z	200	30/ 76	28	0	51.7	-92.5	106.0	8
42182	00	Z	100	29/ 77	21	1	80.7	-148.0	168.6	9
42182	12	Z	50	29/ 77	14	1	99.0	147.0	177.3	4
42314	00	Z	150	27/ 95	19	0	69.5	-116.8	135.9	6
42339	00	Z	200	26/ 73	17	1	65.2	-129.1	144.7	8
42361	00	Z	150	26/ 78	22	2	105.5	-121.8	161.1	9
42369	00	Z	1000	27/ 81	5	24	7.0	-88.0	88.3	10
42369	12	Z	1000	27/ 81	1	24	0.0	-64.0	64.0	7
42379	00	Z	200	27/ 83	19	3	47.1	-130.6	138.8	8
42410	00	Z	150	26/ 92	15	1	123.8	-11.1	124.3	6
42492	12	Z	1000	26/ 85	26	1	10.8	-70.9	71.7	5
42667	00	Z	100	23/ 77	12	0	91.5	-138.0	165.6	5
42667	12	Z	100	23/ 77	11	1	134.9	-109.7	173.9	6
42701	00	Z	30	23/ 85	17	1	184.5	154.4	240.6	6
42724	00	Z	200	24/ 91	21	0	59.0	-102.8	118.5	7
42724	12	Z	150	24/ 91	15	2	71.9	-137.7	155.4	8
42809	00	Z	30	23/ 88	18	1	113.9	234.2	260.5	9
42809	12	Z	100	23/ 88	18	0	110.8	-132.8	172.9	9
42867	00	Z	150	21/ 79	14	0	118.0	-53.1	129.4	5
42971	00	Z	50	20/ 86	10	1	125.3	196.4	233.0	6
42971	12	Z	1000	20/ 86	29	0	14.0	-55.8	57.5	7
43003	00	Z	1000	19/ 73	27	2	6.3	-83.2	83.4	11
43003	12	Z	1000	19/ 73	27	4	9.4	-88.9	89.3	10
43128	00	Z	150	17/ 78	13	0	111.2	-39.5	118.0	10
43150	00	Z	200	18/ 83	20	0	70.3	-72.1	100.7	5
43185	00	Z	100	16/ 81	17	1	106.0	-148.3	182.3	5
43185	12	Z	150	16/ 81	10	2	60.8	177.8	187.9	9
43192	00	Z	200	15/ 74	15	0	30.8	-117.9	121.9	6
43295	00	Z	200	13/ 78	30	0	44.7	-72.2	84.9	5
43311	12	Z	250	11/ 73	22	0	88.5	57.9	105.8	8
43333	00	Z	100	12/ 93	18	1	124.9	-137.3	185.6	5
43333	12	Z	150	12/ 93	27	0	116.7	-109.3	159.8	6
43346	00	Z	100	11/ 80	11	1	118.7	-100.1	155.3	6
43353	00	Z	1000	10/ 76	19	9	4.9	-92.9	93.0	7
43369	00	Z	200	8/ 73	12	0	89.5	-24.2	92.7	5
43369	12	Z	400	8/ 73	16	0	43.4	70.3	82.6	6
43371	00	Z	150	8/ 77	22	1	75.6	-157.5	174.7	9
43371	12	Z	100	8/ 77	20	2	109.5	-104.4	151.4	9
47058	00	Z	1000	39/ 126	20	6	25.4	-51.9	57.8	5
78866	12	Z	1000	18/ -63	18	1	38.5	-19.4	43.1	6
96237	00	Z	200	-2/ 106	11	0	96.2	12.5	97.1	5

Figure 8. TEMP 500 hPa geopotential mean daily count. MAY 2005
All hours
Global average number of observations in 24 hours = 1219

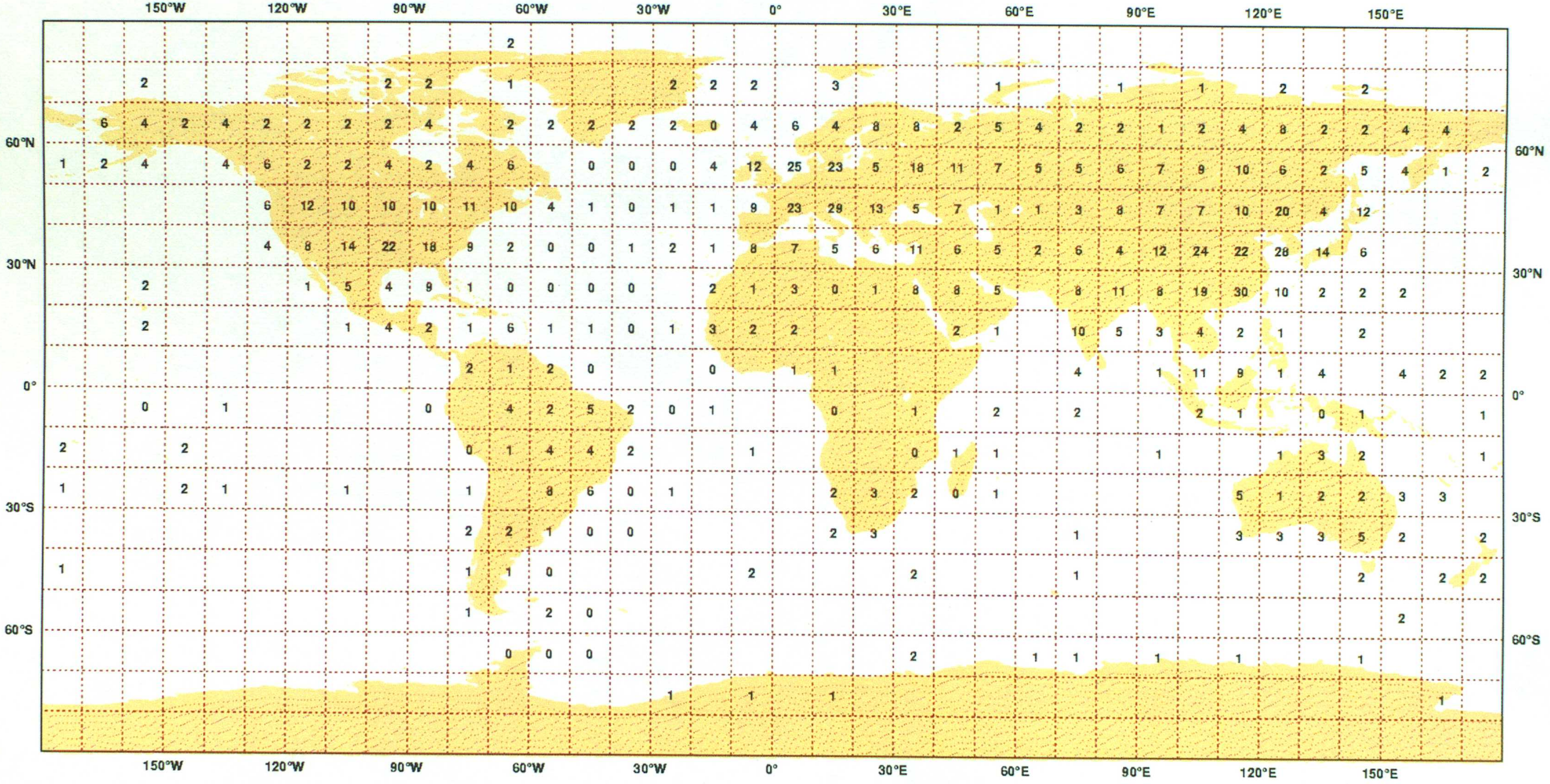

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 1 2 2 2 3 1 1 1 2 2
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 4 6 4 8 8 2 5 4 2 2 1 2 4 8 2 2 4 4
1 2 4 4 6 2 2 4 2 4 6 0 0 0 4 12 25 23 5 18 11 7 5 5 6 7 9 10 6 2 5 4 1 2
6 12 10 10 10 11 10 4 1 0 1 1 9 23 29 13 5 7 1 1 3 8 7 7 10 20 4 12
4 8 14 22 18 9 2 0 0 1 2 1 8 7 5 6 11 6 5 2 6 4 12 24 22 28 14 6
2 1 5 4 9 1 0 0 0 0 2 1 3 0 1 8 8 5 8 11 8 19 30 10 2 2 2
2 1 4 2 1 6 1 1 0 1 3 2 2 2 1 10 5 3 4 2 1 2
2 1 2 0 0 1 1 4 1 11 9 1 4 4 2 2
0 1 0 4 2 5 2 0 1 0 1 2 2 2 1 0 1 1
2 2 0 1 4 4 2 1 0 1 1 1 1 3 2 1
1 2 1 1 1 8 6 0 1 2 3 2 0 1 5 1 2 2 3 3
2 2 1 0 0 2 3 1 3 3 3 5 2 2
1 1 1 0 2 2 1 2 2 2
1 2 0 2
0 0 0 2 1 1 1 1 1
1 1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
41907	12	V	700	24/ 89	23	0	100	-11.5	8.1	16.5	1
42339	12	V	200	26/ 73	15	0	100	0.9	4.7	16.5	1
42361	00	V	300	26/ 78	10	0	100	7.9	-3.0	15.3	1
47058	00	V	300	39/ 126	16	0	100	-12.9	-1.0	26.4	4
47169	00	V	200	35/ 125	29	0	10	-7.6	3.5	30.1	3
47169	12	V	200	35/ 125	30	0	10	-7.8	1.1	25.9	2
48568	12	V	150	7/ 101	17	0	100	-0.2	9.3	18.8	1
56146	12	V	150	32/ 100	20	0	100	9.5	-1.4	16.2	1
60559	12	V	300	33/ 7	10	0	100	-13.4	8.7	23.5	2
60590	00	V	500	31/ 3	10	0	100	-13.3	-1.6	16.7	1
60590	12	V	150	31/ 3	15	0	100	-20.7	1.7	25.0	7
62337	00	V	200	31/ 34	29	0	100	-9.5	6.7	17.0	2
63894	12	V	850	-7/ 39	13	0	23	1.9	-1.7	18.0	1
68263	12	V	250	-26/ 28	14	0	92	-13.1	-1.3	26.3	3
68442	12	V	250	-29/ 26	22	0	100	-9.3	-3.2	15.2	1
68461	12	V	300	-28/ 28	22	0	100	6.3	1.1	20.1	4
85586	12	V	100	-34/ -72	31	0	29	-7.0	-3.9	16.3	1
89009	00	V	300	-90/ 0	27	0	66	-2.7	-13.5	19.5	5
96035	00	V	100	4/ 99	14	0	100	6.9	-3.8	16.8	2

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. MAY 2005
All hours
Global average number of observations in 24 hours = 1364

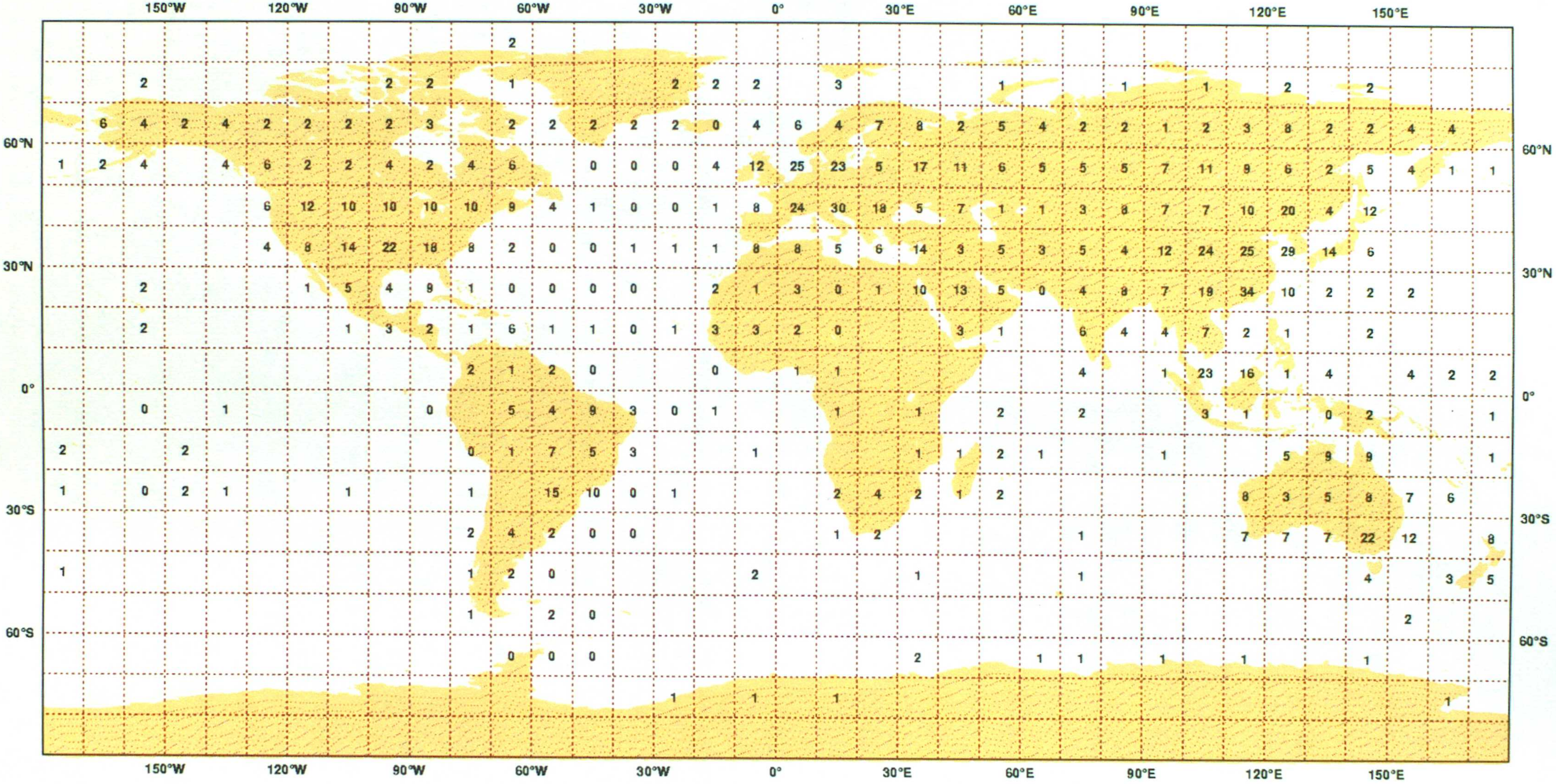

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 1 2 2 2 3 1 1 1 2 2
6 4 2 4 2 2 2 2 3 2 2 2 2 2 0 4 6 4 7 8 2 5 4 2 2 1 2 3 8 2 2 4 4
1 2 4 4 6 2 2 4 2 4 6 0 0 0 4 12 25 23 5 17 11 6 5 5 5 7 11 9 6 2 5 4 1 1
6 12 10 10 10 10 9 4 1 0 0 1 8 24 30 18 5 7 1 1 3 8 7 7 10 20 4 12
4 8 14 22 18 8 2 0 0 1 1 1 8 8 5 6 14 3 5 3 5 4 12 24 25 29 14 6
2 1 5 4 9 1 0 0 0 0 2 1 3 0 1 10 13 5 0 4 8 7 19 34 10 2 2 2
2 1 3 2 1 6 1 1 0 1 3 3 2 0 3 1 6 4 4 7 2 1 2
2 1 2 0 0 1 1 4 1 23 16 1 4 4 2 2
0 1 0 5 4 9 3 0 1 1 1 2 2 3 1 0 2 1
2 2 0 1 7 5 3 1 1 1 2 1 1 5 9 9 1
1 0 2 1 1 1 15 10 0 1 2 4 2 1 2 8 3 5 8 7 6
2 4 2 0 0 1 2 1 7 7 7 22 12 8
1 1 2 0 2 1 1 4 3 5
1 2 0 2
0 0 0 2 1 1 1 1 1
1 1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
ELML7	12	DD	22/ -70	5	-12.4	9.1	16.2
33791	12	DD	48/ 33	24	-15.2	3.6	11.5
42182	00	DD	29/ 77	24	16.5	9.3	11.9
42182	12	DD	29/ 77	26	19.6	9.6	11.3
43295	00	DD	13/ 78	15	-15.4	6.1	24.0
43333	00	DD	12/ 93	16	17.4	9.3	22.1
43333	12	DD	12/ 93	18	15.8	7.4	21.3
58968	00	DD	25/ 122	29	19.9	2.1	8.4
58968	12	DD	25/ 122	28	19.6	3.9	9.7
59758	00	DD	20/ 110	15	11.6	7.4	18.1
59758	12	DD	20/ 110	16	10.2	7.1	19.2
61995	00	DD	-20/ 58	20	-15.6	4.6	14.7
62337	00	DD	31/ 34	29	-20.2	2.9	8.7

MONITORING OF SATELLITE WINDS

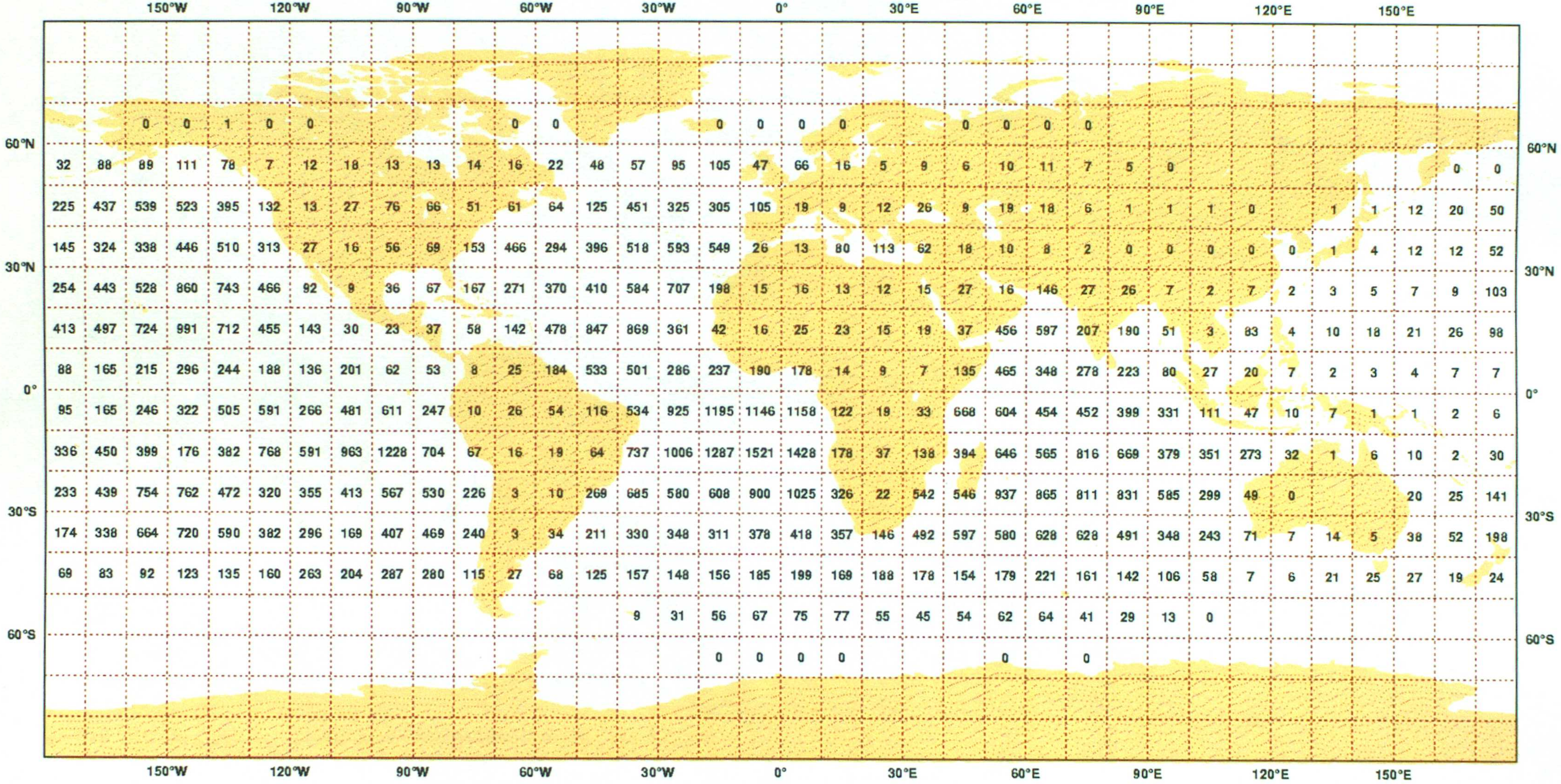
MONITORING CENTRE: EXETER

MONTH: May 2005

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. MAY 2005
Global average number of observations in 24 hours = 91957



		0	0	1	0	0					0	0				0	0	0	0			0	0	0	0										
32	88	89	111	78	7	12	18	13	13	14	16	22	48	57	95	105	47	66	16	5	9	6	10	11	7	5	0							0	0
225	437	539	523	395	132	13	27	76	66	51	61	64	125	451	325	305	105	19	9	12	26	9	19	18	6	1	1	1	0		1	1	12	20	50
145	324	338	446	510	313	27	16	56	69	153	466	294	396	518	593	549	26	13	80	113	62	18	10	8	2	0	0	0	0	0	1	4	12	12	52
254	443	528	860	743	466	92	9	36	67	167	271	370	410	584	707	198	15	16	13	12	15	27	16	146	27	26	7	2	7	2	3	5	7	9	103
413	497	724	991	712	455	143	30	23	37	58	142	478	847	869	361	42	16	25	23	15	19	37	456	597	207	190	51	3	83	4	10	18	21	26	98
88	165	215	296	244	188	136	201	62	53	8	25	184	533	501	286	237	190	178	14	9	7	135	465	348	278	223	80	27	20	7	2	3	4	7	7
95	165	246	322	505	591	266	481	611	247	10	26	54	116	534	925	1195	1146	1158	122	19	33	668	604	454	452	399	331	111	47	10	7	1	1	2	6
336	450	399	176	382	768	591	963	1228	704	67	16	19	64	737	1006	1287	1521	1428	178	37	138	394	646	565	816	669	379	351	273	32	1	6	10	2	30
233	439	754	762	472	320	355	413	567	530	226	3	10	269	685	580	608	900	1025	326	22	542	546	937	865	811	831	585	299	49	0			20	25	141
174	338	664	720	590	382	296	169	407	469	240	3	34	211	330	348	311	378	418	357	146	492	597	580	628	628	491	348	243	71	7	14	5	38	52	198
69	83	92	123	135	160	263	204	287	280	115	27	68	125	157	148	156	185	199	169	188	178	154	179	221	161	142	106	58	7	6	21	25	27	19	24
														9	31	56	67	75	77	55	45	54	62	64	41	29	13	0							
																0	0	0	0				0		0										

Figure 11. SATOB 701 - 1000 hPa vector mean wind. MAY 2005
All observations
Arrows are plotted where greater than 10 obs are present

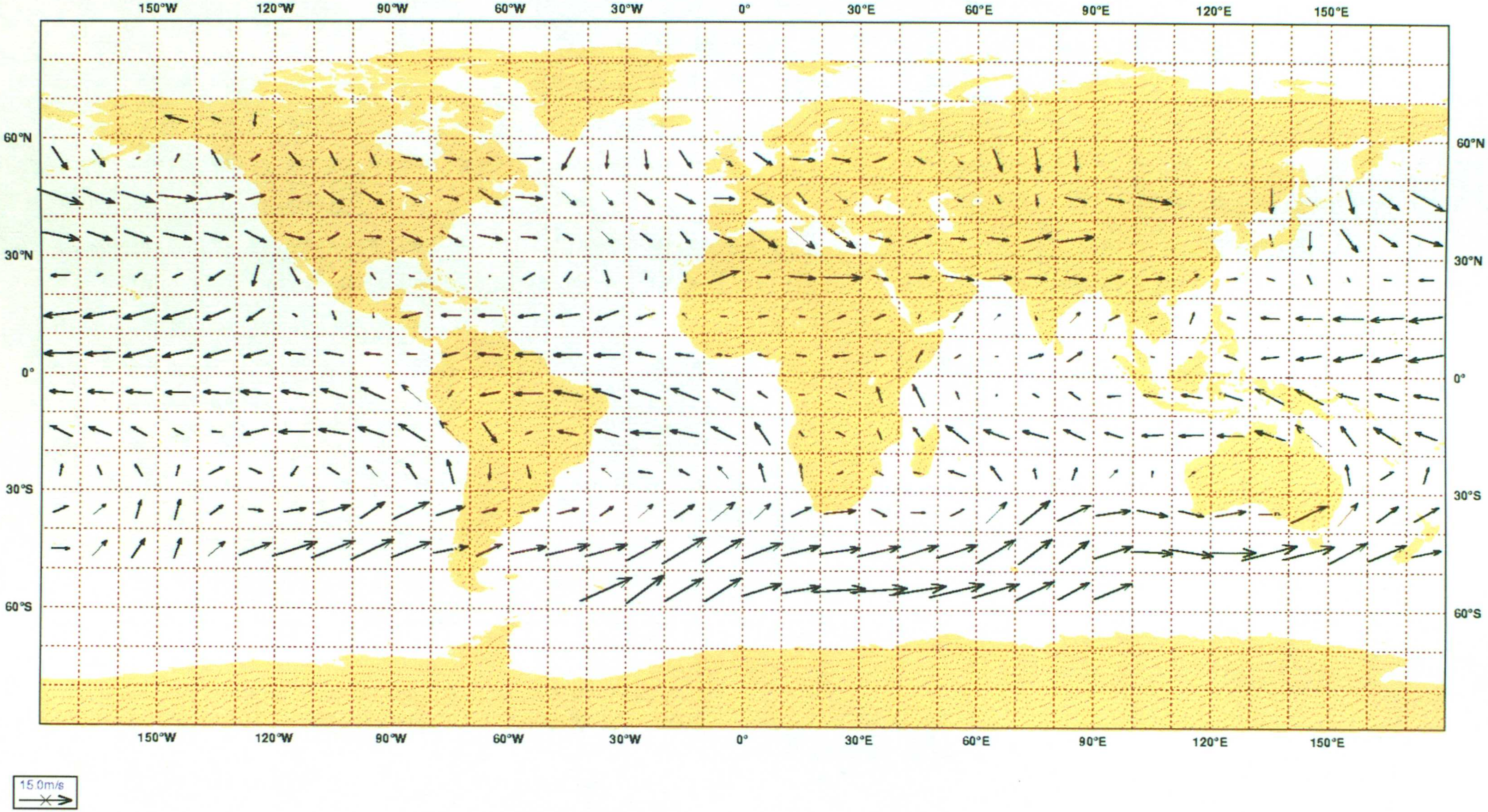

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. MAY 2005
All observations
Arrows are plotted where greater than 10 obs are present

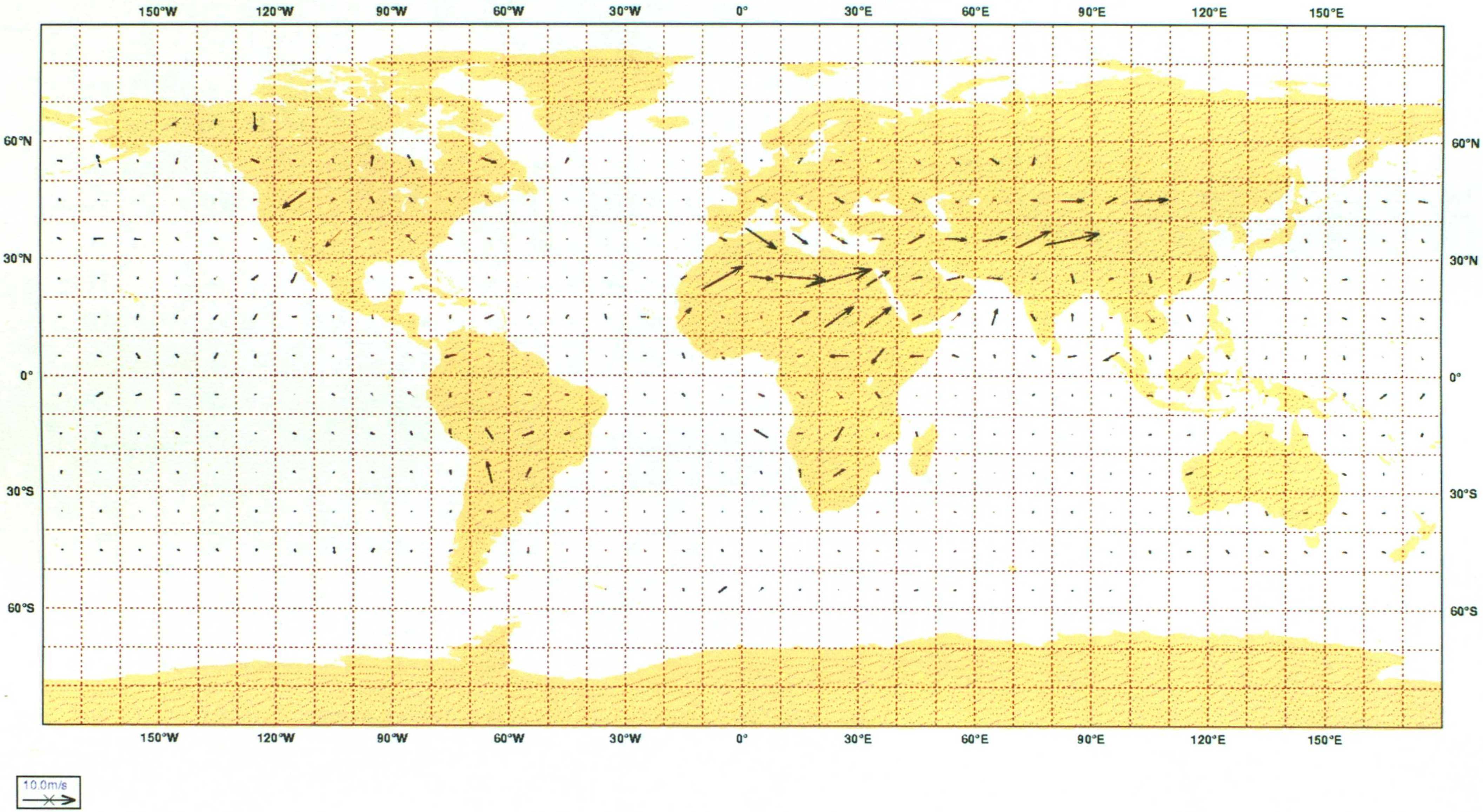

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). MAY 2005
All observations
Values are plotted where greater than 10 obs are present

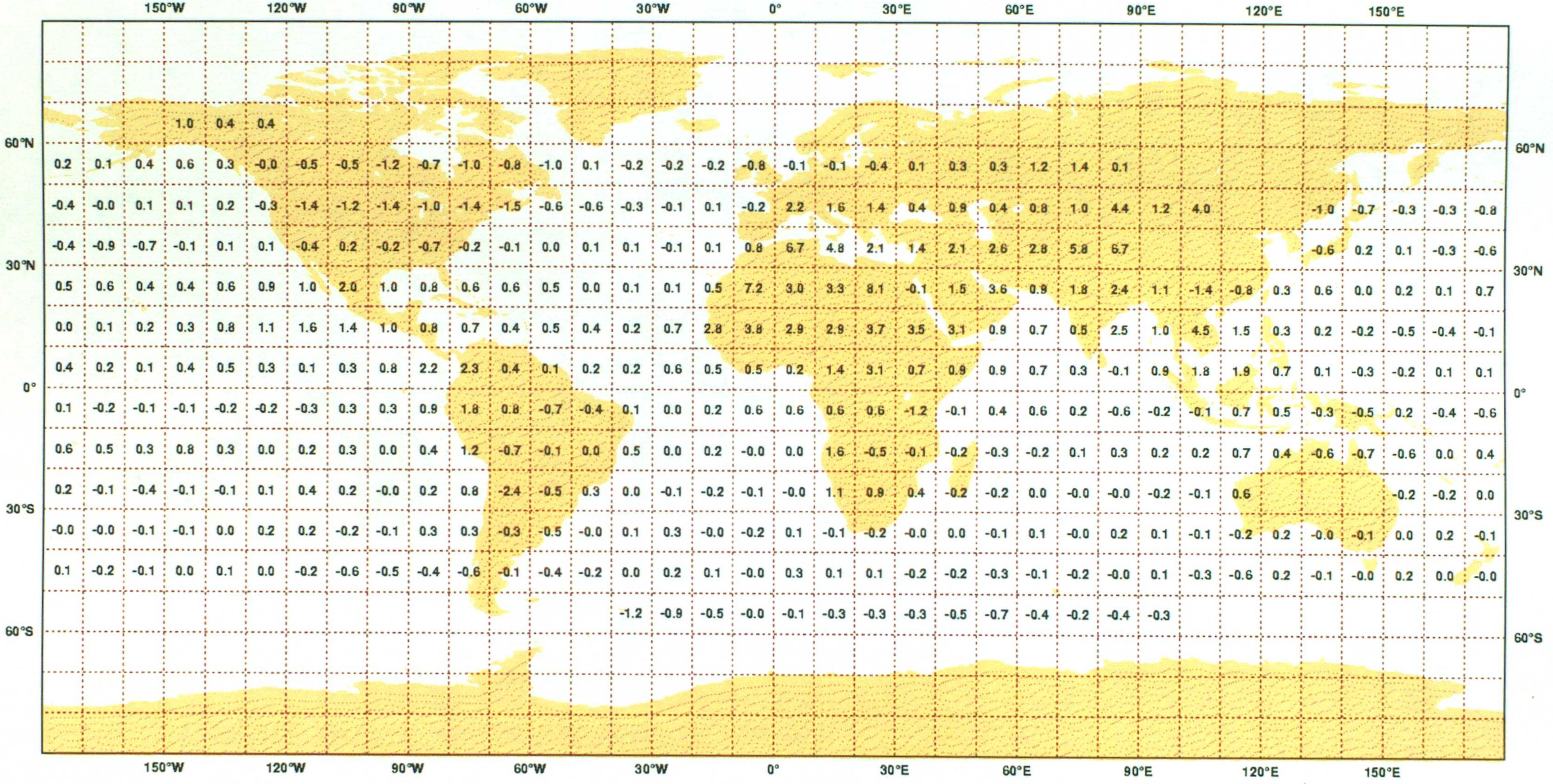
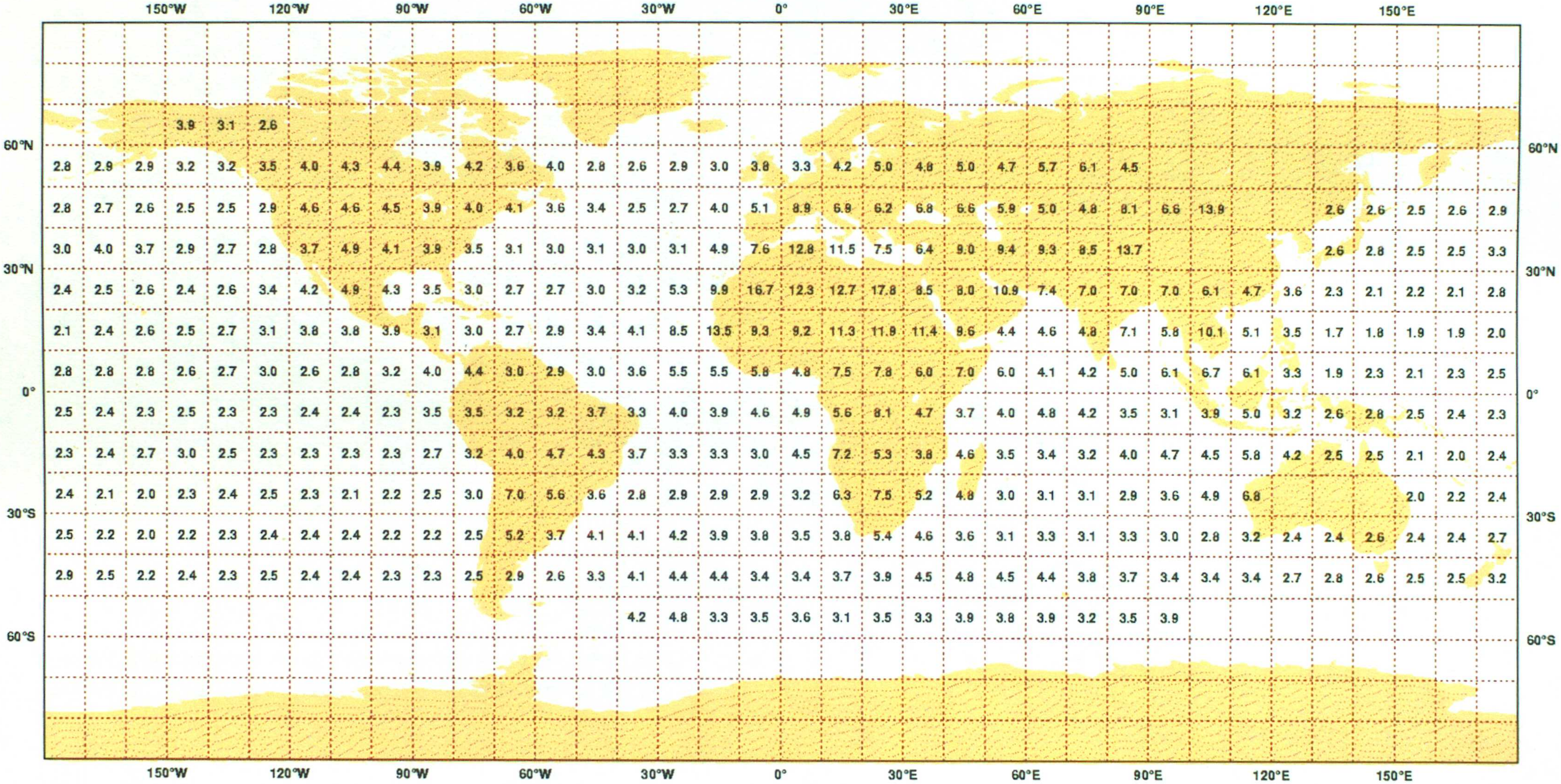

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.0 0.4 0.4
0.2 0.1 0.4 0.6 0.3 -0.0 -0.5 -0.5 -1.2 -0.7 -1.0 -0.8 -1.0 0.1 -0.2 -0.2 -0.2 -0.8 -0.1 -0.1 -0.4 0.1 0.3 0.3 1.2 1.4 0.1
-0.4 -0.0 0.1 0.1 0.2 -0.3 -1.4 -1.2 -1.4 -1.0 -1.4 -1.5 -0.6 -0.6 -0.3 -0.1 0.1 -0.2 2.2 1.6 1.4 0.4 0.9 0.4 0.8 1.0 4.4 1.2 4.0 -1.0 -0.7 -0.3 -0.3 -0.8
-0.4 -0.9 -0.7 -0.1 0.1 0.1 -0.4 0.2 -0.2 -0.7 -0.2 -0.1 0.0 0.1 0.1 -0.1 0.1 0.8 6.7 4.8 2.1 1.4 2.1 2.6 2.8 5.8 6.7 -0.6 0.2 0.1 -0.3 -0.6
0.5 0.6 0.4 0.4 0.6 0.9 1.0 2.0 1.0 0.8 0.6 0.6 0.5 0.0 0.1 0.1 0.5 7.2 3.0 3.3 8.1 -0.1 1.5 3.6 0.9 1.8 2.4 1.1 -1.4 -0.8 0.3 0.6 0.0 0.2 0.1 0.7
0.0 0.1 0.2 0.3 0.8 1.1 1.6 1.4 1.0 0.8 0.7 0.4 0.5 0.4 0.2 0.7 2.8 3.8 2.9 2.9 3.7 3.5 3.1 0.9 0.7 0.5 2.5 1.0 4.5 1.5 0.3 0.2 -0.2 -0.5 -0.4 -0.1
0.4 0.2 0.1 0.4 0.5 0.3 0.1 0.3 0.8 2.2 2.3 0.4 0.1 0.2 0.2 0.6 0.5 0.5 0.2 1.4 3.1 0.7 0.9 0.9 0.7 0.3 -0.1 0.9 1.8 1.9 0.7 0.1 -0.3 -0.2 0.1 0.1
0.1 -0.2 -0.1 -0.1 -0.2 -0.2 -0.3 0.3 0.3 0.9 1.8 0.8 -0.7 -0.4 0.1 0.0 0.2 0.6 0.6 0.6 0.6 -1.2 -0.1 0.4 0.6 0.2 -0.6 -0.2 -0.1 0.7 0.5 -0.3 -0.5 0.2 -0.4 -0.6
0.6 0.5 0.3 0.8 0.3 0.0 0.2 0.3 0.0 0.4 1.2 -0.7 -0.1 0.0 0.5 0.0 0.2 -0.0 0.0 1.6 -0.5 -0.1 -0.2 -0.3 -0.2 0.1 0.3 0.2 0.2 0.7 0.4 -0.6 -0.7 -0.6 0.0 0.4
0.2 -0.1 -0.4 -0.1 -0.1 0.1 0.4 0.2 -0.0 0.2 0.8 -2.4 -0.5 0.3 0.0 -0.1 -0.2 -0.1 -0.0 1.1 0.9 0.4 -0.2 -0.2 0.0 -0.0 -0.0 -0.2 -0.1 0.6 -0.2 -0.2 0.0
-0.0 -0.0 -0.1 -0.1 0.0 0.2 0.2 -0.2 -0.1 0.3 0.3 -0.3 -0.5 -0.0 0.1 0.3 -0.0 -0.2 0.1 -0.1 -0.2 -0.0 0.0 -0.1 0.1 -0.0 0.2 0.1 -0.1 -0.2 0.2 -0.0 -0.1 0.0 0.2 -0.1
0.1 -0.2 -0.1 0.0 0.1 0.0 -0.2 -0.6 -0.5 -0.4 -0.6 -0.1 -0.4 -0.2 0.0 0.2 0.1 -0.0 0.3 0.1 0.1 -0.2 -0.2 -0.3 -0.1 -0.2 -0.0 0.1 -0.3 -0.6 0.2 -0.1 -0.0 0.2 0.0 -0.0
-1.2 -0.9 -0.5 -0.0 -0.1 -0.3 -0.3 -0.3 -0.5 -0.7 -0.4 -0.2 -0.4 -0.3

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). MAY 2005
All observations
Values are plotted where greater than 10 obs are present



			3.9	3.1	2.6																														
2.8	2.9	2.9	3.2	3.2	3.5	4.0	4.3	4.4	3.9	4.2	3.6	4.0	2.8	2.6	2.9	3.0	3.8	3.3	4.2	5.0	4.8	5.0	4.7	5.7	6.1	4.5									
2.8	2.7	2.6	2.5	2.5	2.9	4.6	4.6	4.5	3.9	4.0	4.1	3.6	3.4	2.5	2.7	4.0	5.1	8.9	6.9	6.2	6.8	6.6	5.9	5.0	4.8	8.1	6.6	13.9			2.6	2.6	2.5	2.6	2.9
3.0	4.0	3.7	2.9	2.7	2.8	3.7	4.9	4.1	3.9	3.5	3.1	3.0	3.1	3.0	3.1	4.9	7.6	12.8	11.5	7.5	6.4	9.0	9.4	9.3	8.5	13.7					2.6	2.8	2.5	2.5	3.3
2.4	2.5	2.6	2.4	2.6	3.4	4.2	4.9	4.3	3.5	3.0	2.7	2.7	3.0	3.2	5.3	9.9	16.7	12.3	12.7	17.8	8.5	8.0	10.9	7.4	7.0	7.0	7.0	6.1	4.7	3.6	2.3	2.1	2.2	2.1	2.8
2.1	2.4	2.6	2.5	2.7	3.1	3.8	3.8	3.9	3.1	3.0	2.7	2.9	3.4	4.1	8.5	13.5	9.3	9.2	11.3	11.9	11.4	9.6	4.4	4.6	4.8	7.1	5.8	10.1	5.1	3.5	1.7	1.8	1.9	1.9	2.0
2.8	2.8	2.8	2.6	2.7	3.0	2.6	2.8	3.2	4.0	4.4	3.0	2.9	3.0	3.6	5.5	5.5	5.8	4.8	7.5	7.8	6.0	7.0	6.0	4.1	4.2	5.0	6.1	6.7	6.1	3.3	1.9	2.3	2.1	2.3	2.5
2.5	2.4	2.3	2.5	2.3	2.3	2.4	2.4	2.3	3.5	3.5	3.2	3.2	3.7	3.3	4.0	3.9	4.6	4.9	5.6	8.1	4.7	3.7	4.0	4.8	4.2	3.5	3.1	3.9	5.0	3.2	2.6	2.8	2.5	2.4	2.3
2.3	2.4	2.7	3.0	2.5	2.3	2.3	2.3	2.3	2.7	3.2	4.0	4.7	4.3	3.7	3.3	3.3	3.0	4.5	7.2	5.3	3.8	4.6	3.5	3.4	3.2	4.0	4.7	4.5	5.8	4.2	2.5	2.5	2.1	2.0	2.4
2.4	2.1	2.0	2.3	2.4	2.5	2.3	2.1	2.2	2.5	3.0	7.0	5.6	3.6	2.8	2.9	2.9	2.9	3.2	6.3	7.5	5.2	4.8	3.0	3.1	3.1	2.9	3.6	4.9	6.8				2.0	2.2	2.4
2.5	2.2	2.0	2.2	2.3	2.4	2.4	2.4	2.2	2.2	2.5	5.2	3.7	4.1	4.1	4.2	3.9	3.8	3.5	3.8	5.4	4.6	3.6	3.1	3.3	3.1	3.3	3.0	2.8	3.2	2.4	2.4	2.6	2.4	2.4	2.7
2.9	2.5	2.2	2.4	2.3	2.5	2.4	2.4	2.3	2.3	2.5	2.9	2.6	3.3	4.1	4.4	4.4	3.4	3.4	3.7	3.9	4.5	4.8	4.5	4.4	3.8	3.7	3.4	3.4	3.4	2.7	2.8	2.6	2.5	2.5	3.2
														4.2	4.8	3.3	3.5	3.6	3.1	3.5	3.3	3.9	3.8	3.9	3.2	3.5	3.9								

Figure 15. SATOB 401 - 700 hPa mean daily count. MAY 2005
Global average number of observations in 24 hours = 24085

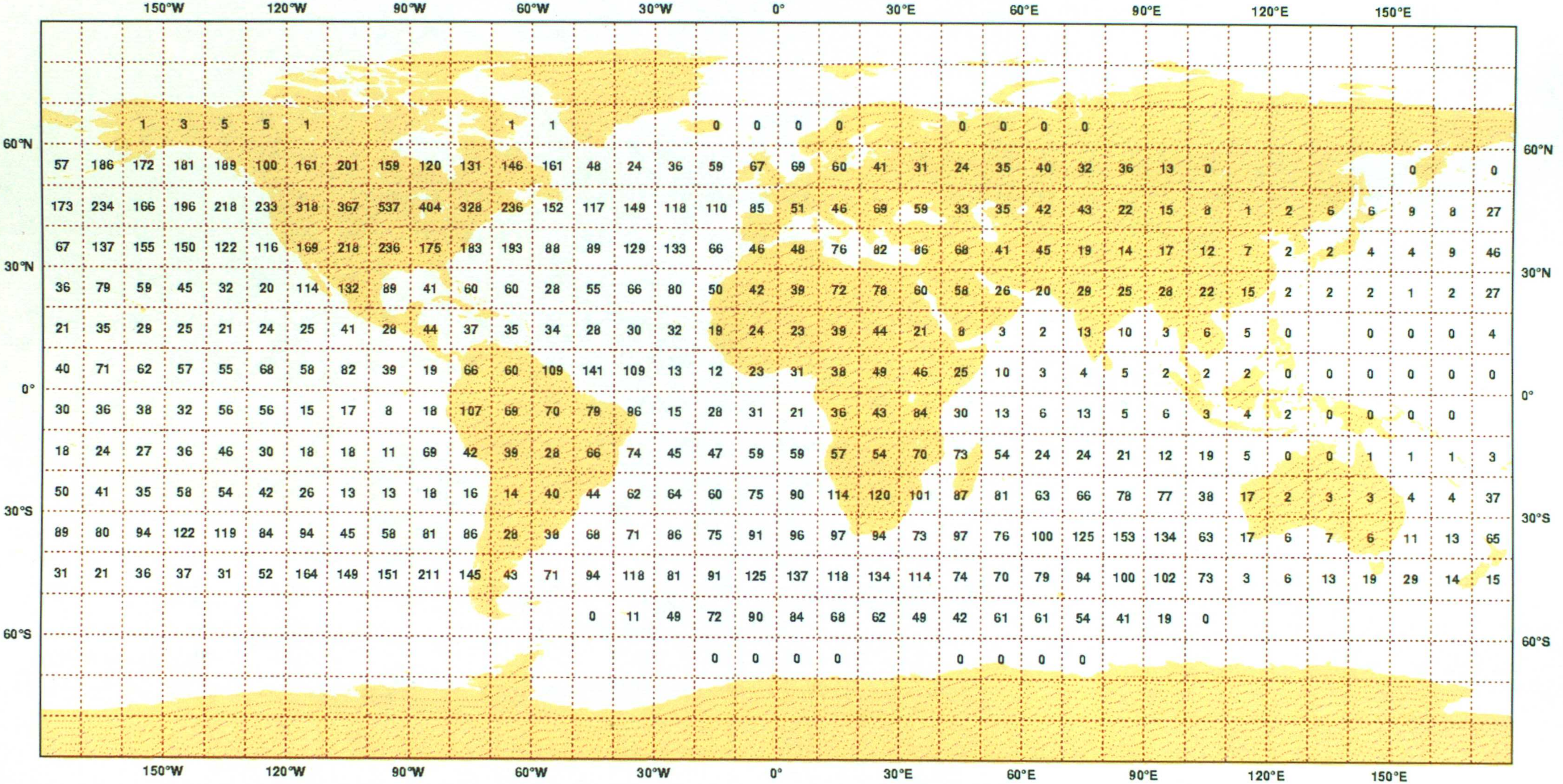

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 3 5 5 1 1 1 0 0 0 0 0 0 0 0
57 186 172 181 189 100 161 201 159 120 131 146 161 48 24 36 59 67 69 60 41 31 24 35 40 32 36 13 0 0 0
173 234 166 196 218 233 318 367 537 404 328 236 152 117 149 118 110 85 51 46 69 59 33 35 42 43 22 15 8 1 2 6 6 9 8 27
67 137 155 150 122 116 169 218 236 175 183 193 88 89 129 133 66 46 48 76 82 86 68 41 45 19 14 17 12 7 2 2 4 4 9 46
36 79 59 45 32 20 114 132 89 41 60 60 28 55 66 80 50 42 39 72 78 60 58 26 20 29 25 28 22 15 2 2 2 1 2 27
21 35 29 25 21 24 25 41 28 44 37 35 34 28 30 32 19 24 23 39 44 21 8 3 2 13 10 3 6 5 0 0 0 0 4
40 71 62 57 55 68 58 82 39 19 66 60 109 141 109 13 12 23 31 38 49 46 25 10 3 4 5 2 2 2 0 0 0 0 0 0
30 36 38 32 56 56 15 17 8 18 107 69 70 79 96 15 28 31 21 36 43 84 30 13 6 13 5 6 3 4 2 0 0 0 0
18 24 27 36 46 30 18 18 11 69 42 39 28 66 74 45 47 59 59 57 54 70 73 54 24 24 21 12 19 5 0 0 1 1 1 3
50 41 35 58 54 42 26 13 13 18 16 14 40 44 62 64 60 75 90 114 120 101 87 81 63 66 78 77 38 17 2 3 3 4 4 37
89 80 94 122 119 84 94 45 58 81 86 28 38 68 71 86 75 91 96 97 94 73 97 76 100 125 153 134 63 17 6 7 6 11 13 65
31 21 36 37 31 52 164 149 151 211 145 43 71 94 118 81 91 125 137 118 134 114 74 70 79 94 100 102 73 3 6 13 19 29 14 15
0 11 49 72 90 84 68 62 49 42 61 61 54 41 19 0
0 0 0 0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. MAY 2005
All observations
Arrows are plotted where greater than 10 obs are present

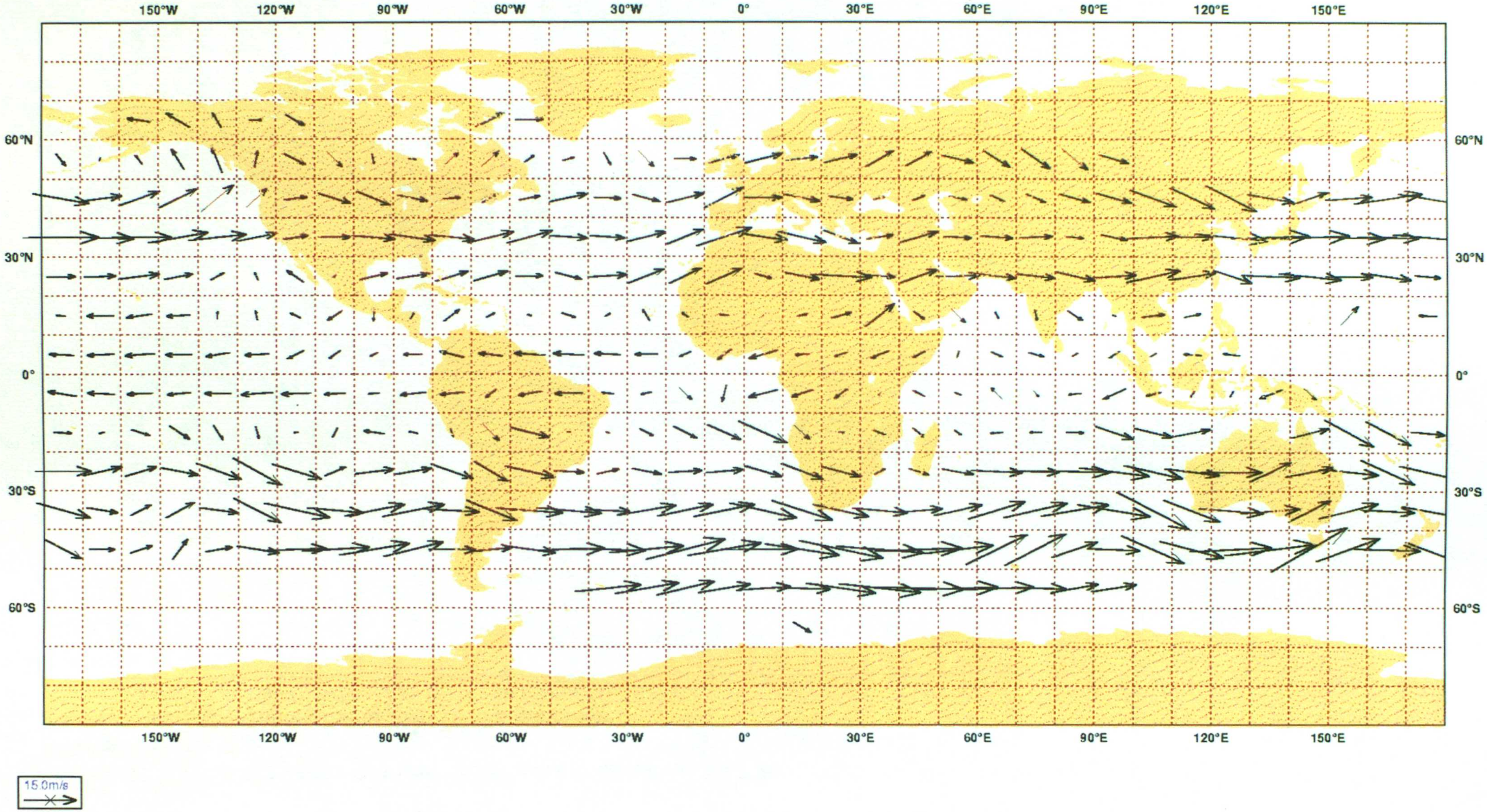

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. MAY 2005
All observations
Arrows are plotted where greater than 10 obs are present

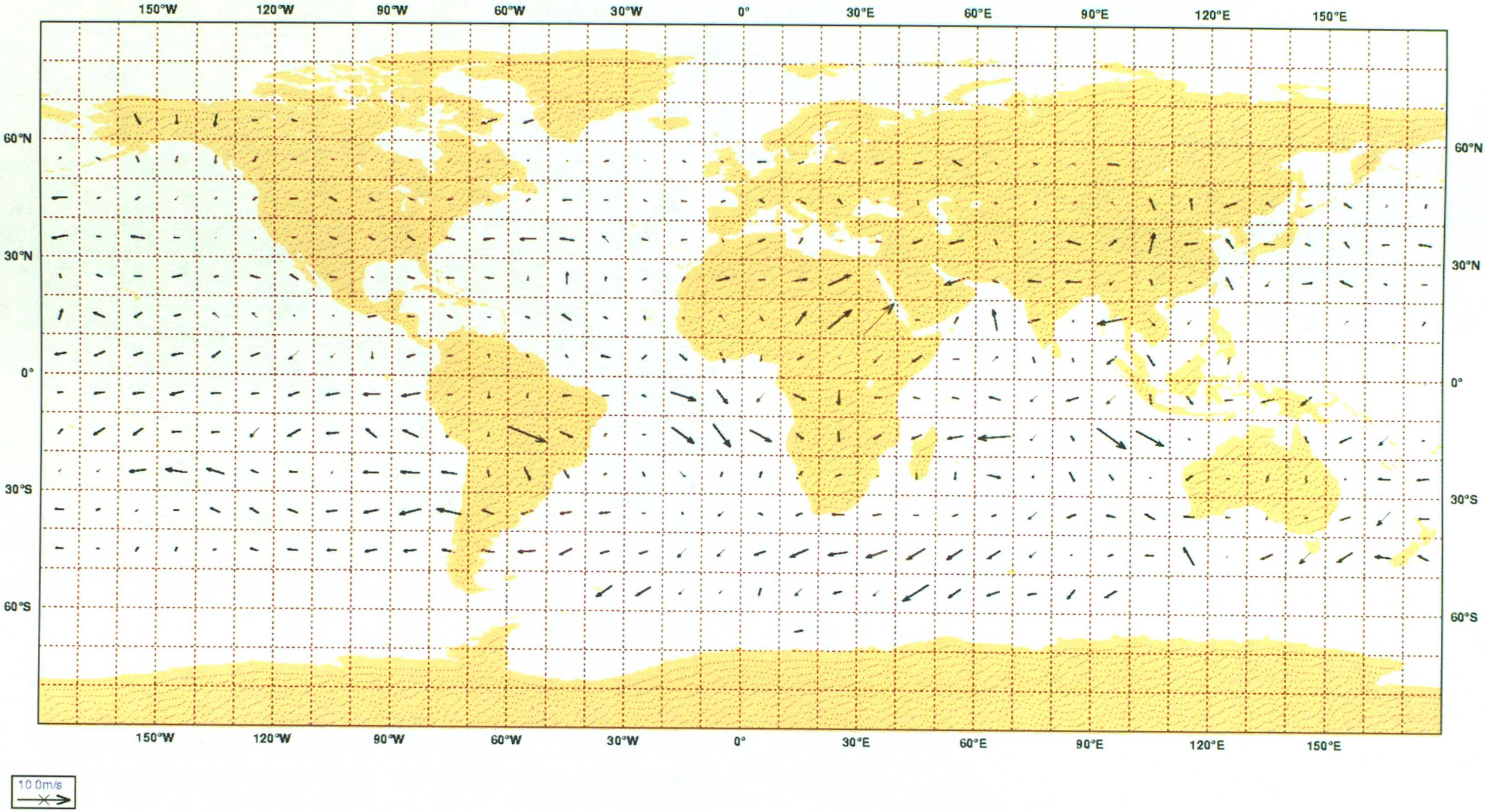

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). MAY 2005
All observations
Values are plotted where greater than 10 obs are present

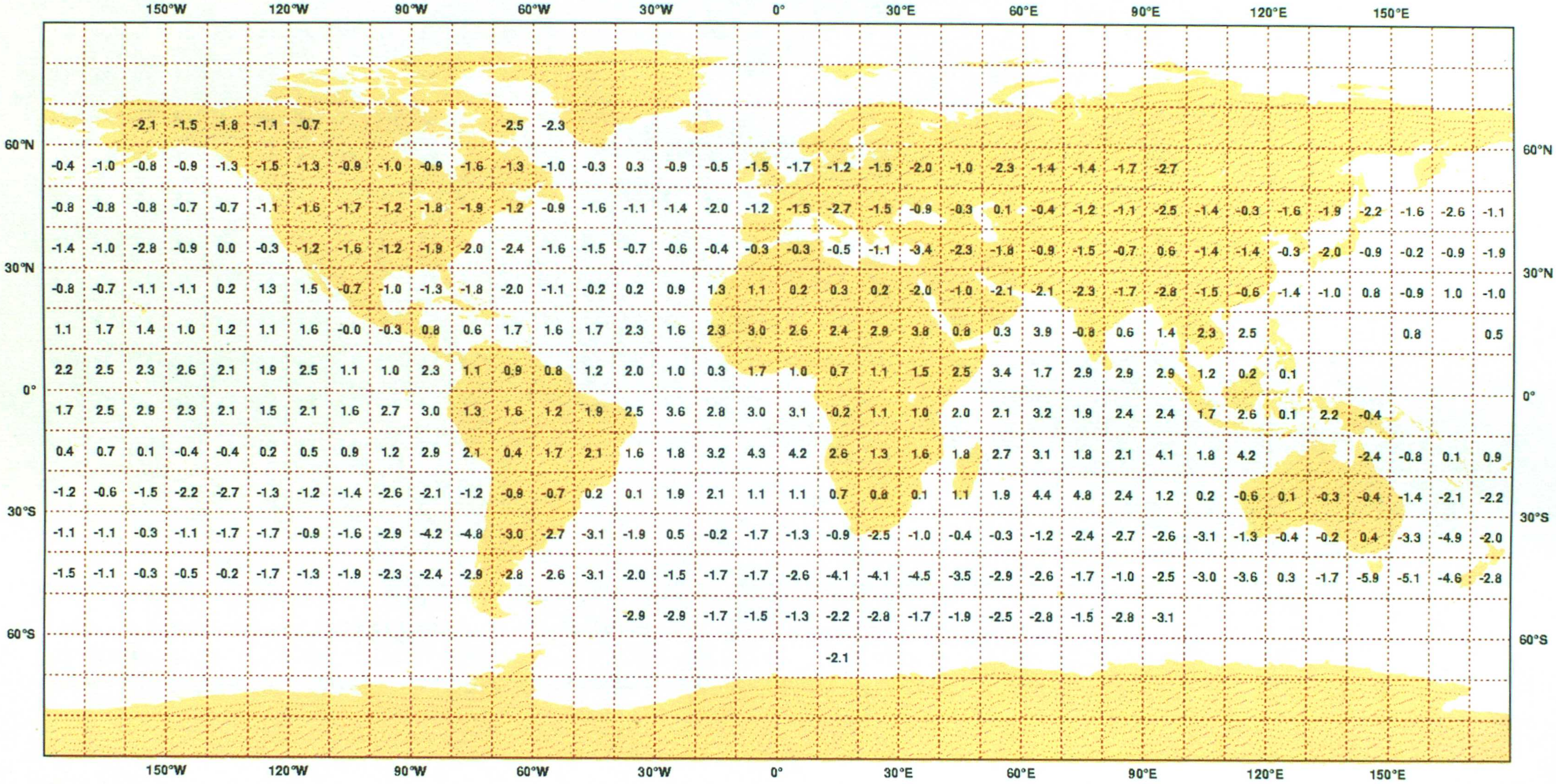

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-2.1 -1.5 -1.8 -1.1 -0.7 -2.5 -2.3
-0.4 -1.0 -0.8 -0.9 -1.3 -1.5 -1.3 -0.9 -1.0 -0.9 -1.6 -1.3 -1.0 -0.3 0.3 -0.9 -0.5 -1.5 -1.7 -1.2 -1.5 -2.0 -1.0 -2.3 -1.4 -1.4 -1.7 -2.7
-0.8 -0.8 -0.8 -0.7 -0.7 -1.1 -1.6 -1.7 -1.2 -1.8 -1.9 -1.2 -0.9 -1.6 -1.1 -1.4 -2.0 -1.2 -1.5 -2.7 -1.5 -0.9 -0.3 0.1 -0.4 -1.2 -1.1 -2.5 -1.4 -0.3 -1.6 -1.9 -2.2 -1.6 -2.6 -1.1
-1.4 -1.0 -2.8 -0.9 0.0 -0.3 -1.2 -1.6 -1.2 -1.9 -2.0 -2.4 -1.6 -1.5 -0.7 -0.6 -0.4 -0.3 -0.3 -0.5 -1.1 -3.4 -2.3 -1.8 -0.9 -1.5 -0.7 0.6 -1.4 -1.4 -0.3 -2.0 -0.9 -0.2 -0.9 -1.9
-0.8 -0.7 -1.1 -1.1 0.2 1.3 1.5 -0.7 -1.0 -1.3 -1.8 -2.0 -1.1 -0.2 0.2 0.9 1.3 1.1 0.2 0.3 0.2 -2.0 -1.0 -2.1 -2.1 -2.3 -1.7 -2.8 -1.5 -0.6 -1.4 -1.0 0.8 -0.9 1.0 -1.0
1.1 1.7 1.4 1.0 1.2 1.1 1.6 -0.0 -0.3 0.8 0.6 1.7 1.6 1.7 2.3 1.6 2.3 3.0 2.6 2.4 2.9 3.8 0.8 0.3 3.9 -0.8 0.6 1.4 2.3 2.5 0.8 0.5
2.2 2.5 2.3 2.6 2.1 1.9 2.5 1.1 1.0 2.3 1.1 0.9 0.8 1.2 2.0 1.0 0.3 1.7 1.0 0.7 1.1 1.5 2.5 3.4 1.7 2.9 2.9 2.9 1.2 0.2 0.1
1.7 2.5 2.9 2.3 2.1 1.5 2.1 1.6 2.7 3.0 1.3 1.6 1.2 1.9 2.5 3.6 2.8 3.0 3.1 -0.2 1.1 1.0 2.0 2.1 3.2 1.9 2.4 2.4 1.7 2.6 0.1 2.2 -0.4
0.4 0.7 0.1 -0.4 -0.4 0.2 0.5 0.9 1.2 2.9 2.1 0.4 1.7 2.1 1.6 1.8 3.2 4.3 4.2 2.6 1.3 1.6 1.8 2.7 3.1 1.8 2.1 4.1 1.8 4.2 -2.4 -0.8 0.1 0.9
-1.2 -0.6 -1.5 -2.2 -2.7 -1.3 -1.2 -1.4 -2.6 -2.1 -1.2 -0.9 -0.7 0.2 0.1 1.9 2.1 1.1 1.1 0.7 0.8 0.1 1.1 1.9 4.4 4.8 2.4 1.2 0.2 -0.6 0.1 -0.3 -0.4 -1.4 -2.1 -2.2
-1.1 -1.1 -0.3 -1.1 -1.7 -1.7 -0.9 -1.6 -2.9 -4.2 -4.8 -3.0 -2.7 -3.1 -1.9 0.5 -0.2 -1.7 -1.3 -0.9 -2.5 -1.0 -0.4 -0.3 -1.2 -2.4 -2.7 -2.6 -3.1 -1.3 -0.4 -0.2 0.4 -3.3 -4.9 -2.0
-1.5 -1.1 -0.3 -0.5 -0.2 -1.7 -1.3 -1.9 -2.3 -2.4 -2.9 -2.8 -2.6 -3.1 -2.0 -1.5 -1.7 -1.7 -2.6 -4.1 -4.1 -4.5 -3.5 -2.9 -2.6 -1.7 -1.0 -2.5 -3.0 -3.6 0.3 -1.7 -5.9 -5.1 -4.6 -2.8
-2.9 -2.9 -1.7 -1.5 -1.3 -2.2 -2.8 -1.7 -1.9 -2.5 -2.8 -1.5 -2.8 -3.1
-2.1

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). MAY 2005
All observations
Values are plotted where greater than 10 obs are present

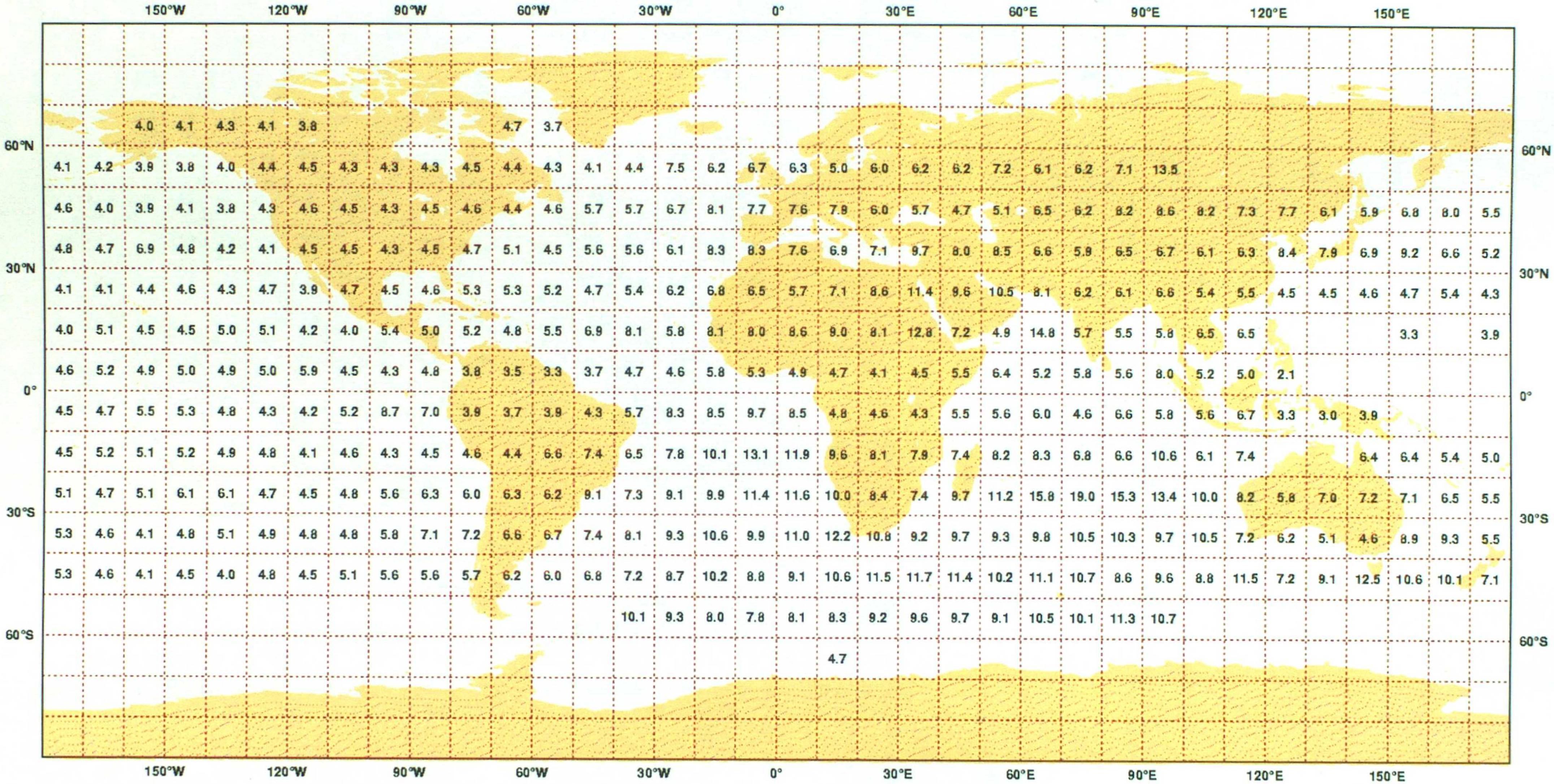
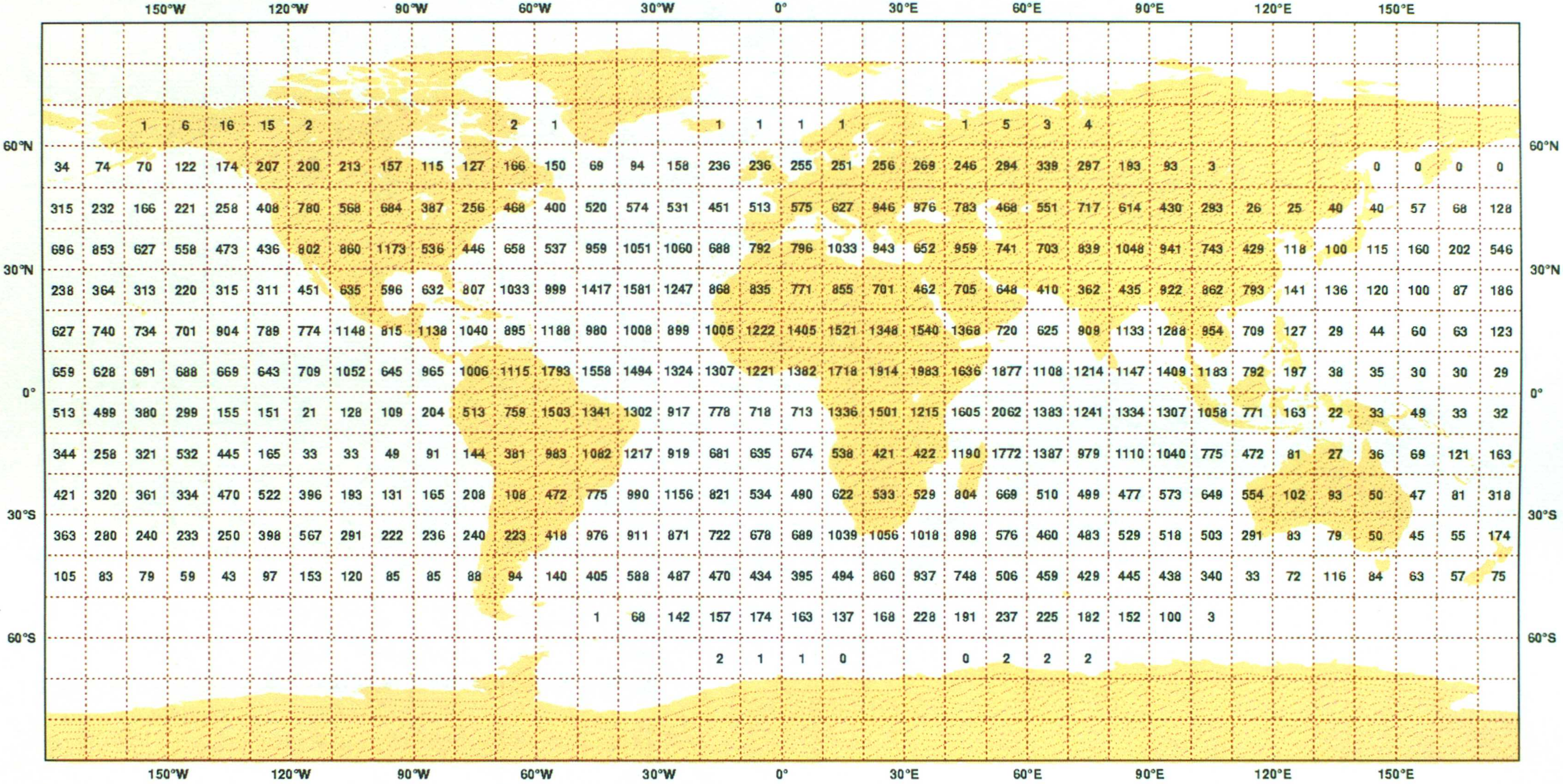

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
4.0 4.1 4.3 4.1 3.8 4.7 3.7
4.1 4.2 3.9 3.8 4.0 4.4 4.5 4.3 4.3 4.3 4.5 4.4 4.3 4.1 4.4 7.5 6.2 6.7 6.3 5.0 6.0 6.2 6.2 7.2 6.1 6.2 7.1 13.5
4.6 4.0 3.9 4.1 3.8 4.3 4.6 4.5 4.3 4.5 4.6 4.4 4.6 5.7 5.7 6.7 8.1 7.7 7.6 7.9 6.0 5.7 4.7 5.1 6.5 6.2 8.2 8.6 8.2 7.3 7.7 6.1 5.9 6.8 8.0 5.5
4.8 4.7 6.9 4.8 4.2 4.1 4.5 4.5 4.3 4.5 4.7 5.1 4.5 5.6 5.6 6.1 8.3 8.3 7.6 6.9 7.1 9.7 8.0 8.5 6.6 5.9 6.5 6.7 6.1 6.3 8.4 7.9 6.9 9.2 6.6 5.2
4.1 4.1 4.4 4.6 4.3 4.7 3.9 4.7 4.5 4.6 5.3 5.3 5.2 4.7 5.4 6.2 6.8 6.5 5.7 7.1 8.6 11.4 9.6 10.5 8.1 6.2 6.1 6.6 5.4 5.5 4.5 4.5 4.6 4.7 5.4 4.3
4.0 5.1 4.5 4.5 5.0 5.1 4.2 4.0 5.4 5.0 5.2 4.8 5.5 6.9 8.1 5.8 8.1 8.0 8.6 9.0 8.1 12.8 7.2 4.9 14.8 5.7 5.5 5.8 6.5 6.5 3.3 3.9
4.6 5.2 4.9 5.0 4.9 5.0 5.9 4.5 4.3 4.8 3.8 3.5 3.3 3.7 4.7 4.6 5.8 5.3 4.9 4.7 4.1 4.5 5.5 6.4 5.2 5.8 5.6 8.0 5.2 5.0 2.1
4.5 4.7 5.5 5.3 4.8 4.3 4.2 5.2 8.7 7.0 3.9 3.7 3.9 4.3 5.7 8.3 8.5 9.7 8.5 4.8 4.6 4.3 5.5 5.6 6.0 4.6 6.6 5.8 5.6 6.7 3.3 3.0 3.9
4.5 5.2 5.1 5.2 4.9 4.8 4.1 4.6 4.3 4.5 4.6 4.4 6.6 7.4 6.5 7.8 10.1 13.1 11.9 9.6 8.1 7.9 7.4 8.2 8.3 6.8 6.6 10.6 6.1 7.4 6.4 6.4 5.4 5.0
5.1 4.7 5.1 6.1 6.1 4.7 4.5 4.8 5.6 6.3 6.0 6.3 6.2 9.1 7.3 9.1 9.9 11.4 11.6 10.0 8.4 7.4 9.7 11.2 15.8 19.0 15.3 13.4 10.0 8.2 5.8 7.0 7.2 7.1 6.5 5.5
5.3 4.6 4.1 4.8 5.1 4.9 4.8 4.8 5.8 7.1 7.2 6.6 6.7 7.4 8.1 9.3 10.6 9.9 11.0 12.2 10.8 9.2 9.7 9.3 9.8 10.5 10.3 9.7 10.5 7.2 6.2 5.1 4.6 8.9 9.3 5.5
5.3 4.6 4.1 4.5 4.0 4.8 4.5 5.1 5.6 5.6 5.7 6.2 6.0 6.8 7.2 8.7 10.2 8.8 9.1 10.6 11.5 11.7 11.4 10.2 11.1 10.7 8.6 9.6 8.8 11.5 7.2 9.1 12.5 10.6 10.1 7.1
10.1 9.3 8.0 7.8 8.1 8.3 9.2 9.6 9.7 9.1 10.5 10.1 11.3 10.7
4.7

Figure 20. SATOB 101 - 400 hPa mean daily count. MAY 2005
Global average number of observations in 24 hours = 223431



		1	6	16	15	2					2	1				1	1	1	1			1	5	3	4										
34	74	70	122	174	207	200	213	157	115	127	166	150	69	94	158	236	236	255	251	256	269	246	294	339	297	183	93	3				0	0	0	0
315	232	166	221	258	408	780	568	684	387	256	468	400	520	574	531	451	513	575	627	946	976	783	468	551	717	614	430	293	26	25	40	40	57	68	128
696	853	627	558	473	436	802	860	1173	536	446	658	537	959	1051	1060	688	792	796	1033	943	652	959	741	703	839	1048	941	743	429	118	100	115	160	202	546
238	364	313	220	315	311	451	635	596	632	807	1033	999	1417	1581	1247	868	835	771	855	701	462	705	648	410	362	435	922	862	793	141	136	120	100	87	186
627	740	734	701	904	789	774	1148	815	1138	1040	895	1188	980	1008	899	1005	1222	1405	1521	1348	1540	1368	720	625	909	1133	1288	954	709	127	29	44	60	63	123
659	628	691	688	669	643	709	1052	645	965	1006	1115	1793	1558	1494	1324	1307	1221	1382	1718	1914	1983	1636	1877	1108	1214	1147	1409	1183	792	197	38	35	30	30	29
513	499	380	299	155	151	21	128	109	204	513	759	1503	1341	1302	917	778	718	713	1336	1501	1215	1605	2062	1383	1241	1334	1307	1058	771	163	22	33	49	33	32
344	258	321	532	445	165	33	33	49	91	144	381	983	1082	1217	919	681	635	674	538	421	422	1190	1772	1387	979	1110	1040	775	472	81	27	36	69	121	163
421	320	361	334	470	522	396	193	131	165	208	108	472	775	990	1156	821	534	490	622	533	529	804	669	510	499	477	573	649	554	102	93	50	47	81	318
363	280	240	233	250	398	567	291	222	236	240	223	418	976	911	871	722	678	689	1039	1056	1018	898	576	460	483	529	518	503	291	83	79	50	45	55	174
105	83	79	59	43	97	153	120	85	85	88	94	140	405	588	487	470	434	395	494	860	937	748	506	459	429	445	438	340	33	72	116	84	63	57	75
													1	68	142	157	174	163	137	168	228	191	237	225	182	152	100	3							
																2	1	1	0			0	2	2	2										

Figure 21. SATOB 101 - 400 hPa vector mean wind. MAY 2005
All observations
Arrows are plotted where greater than 10 obs are present

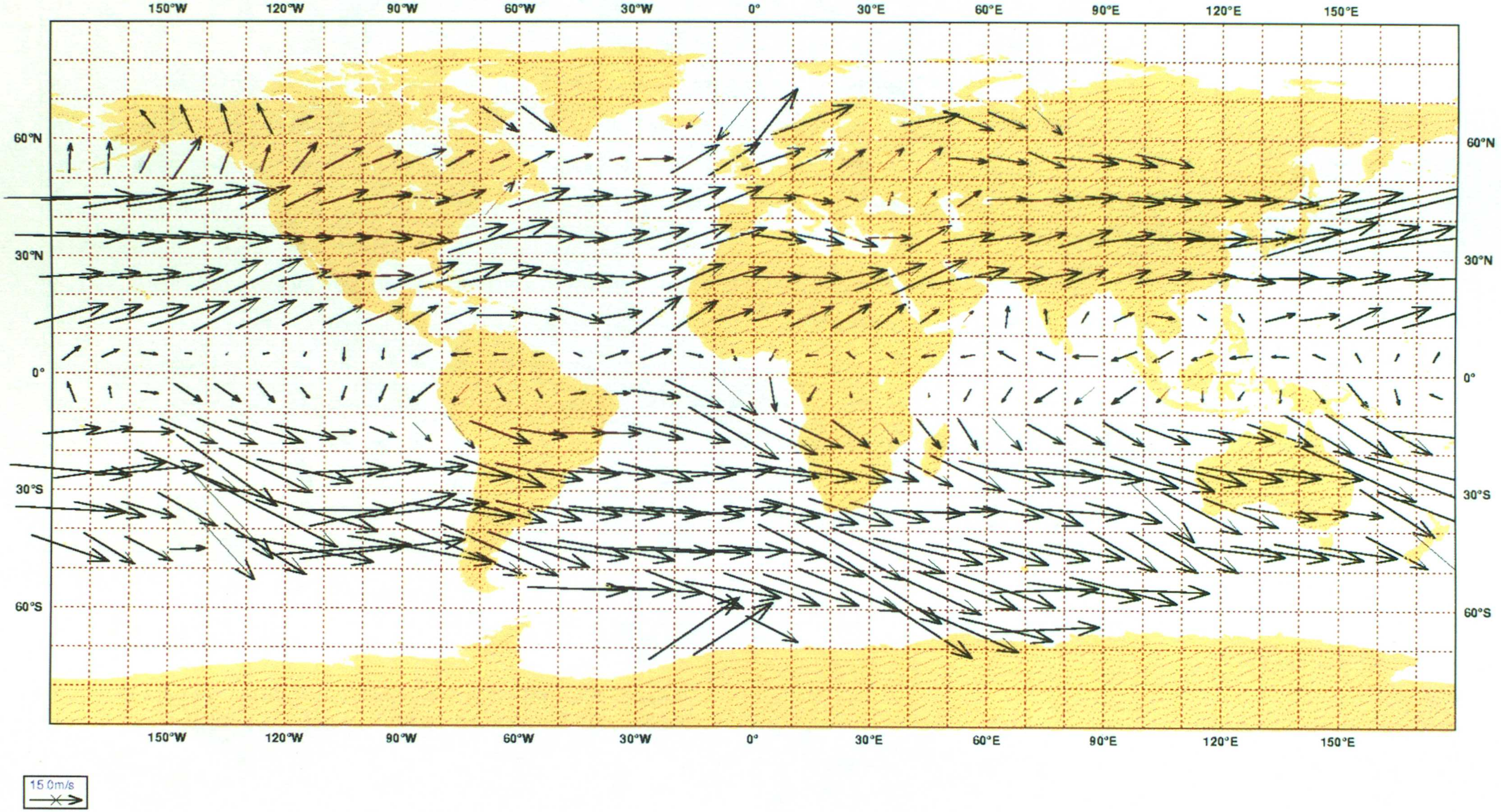

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. MAY 2005
All observations
Arrows are plotted where greater than 10 obs are present

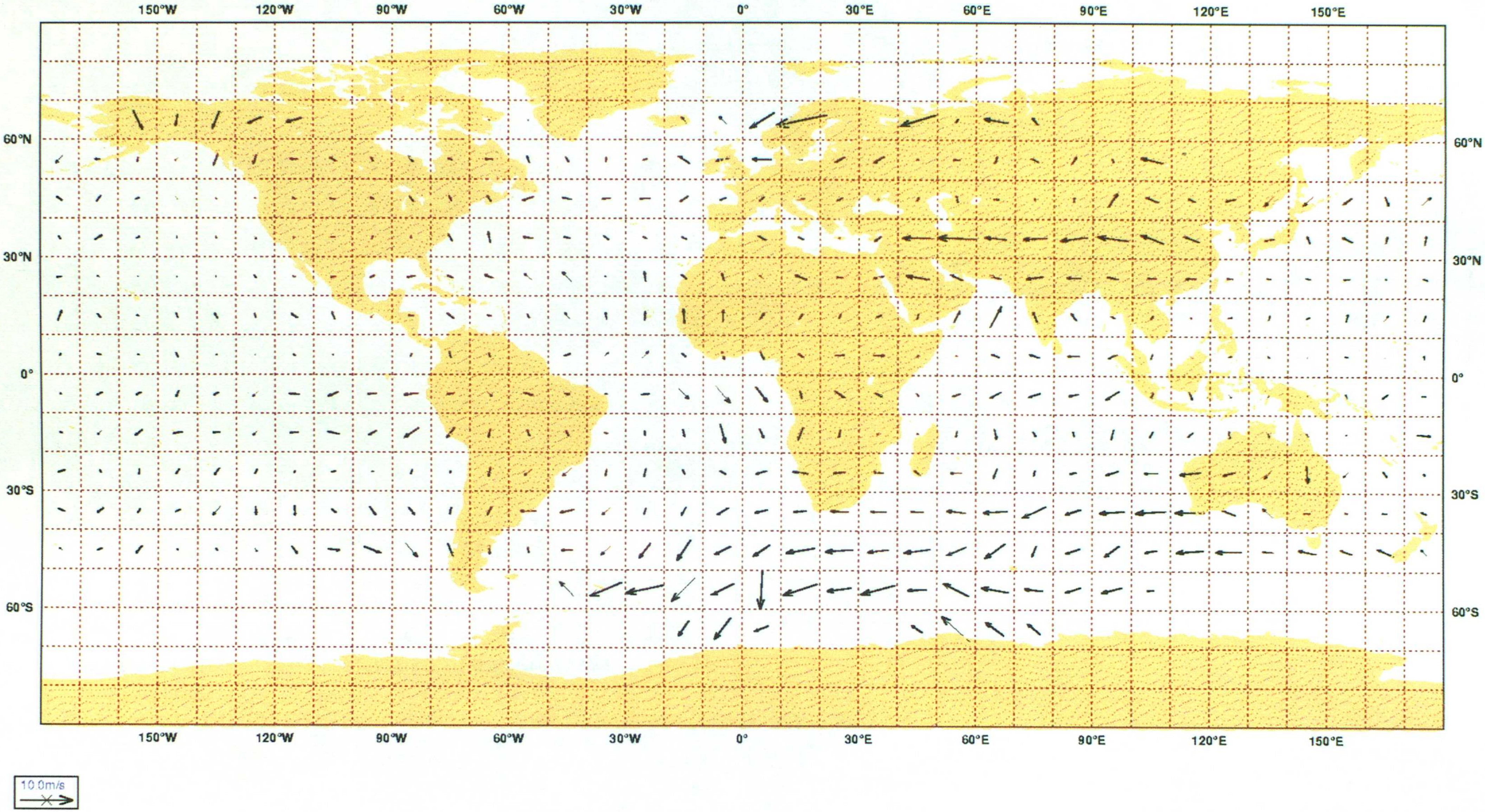

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). MAY 2005
All observations
Values are plotted where greater than 10 obs are present

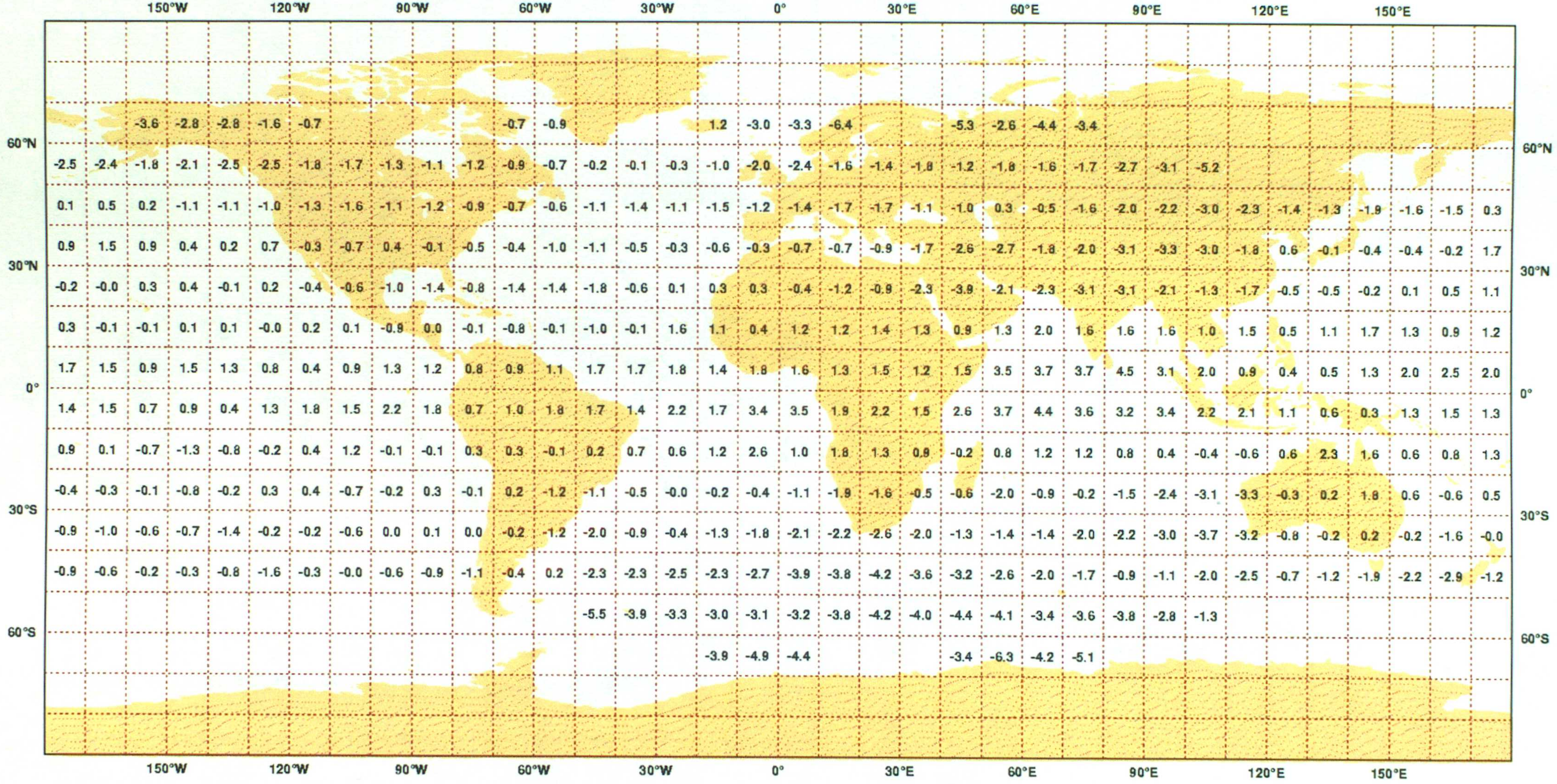
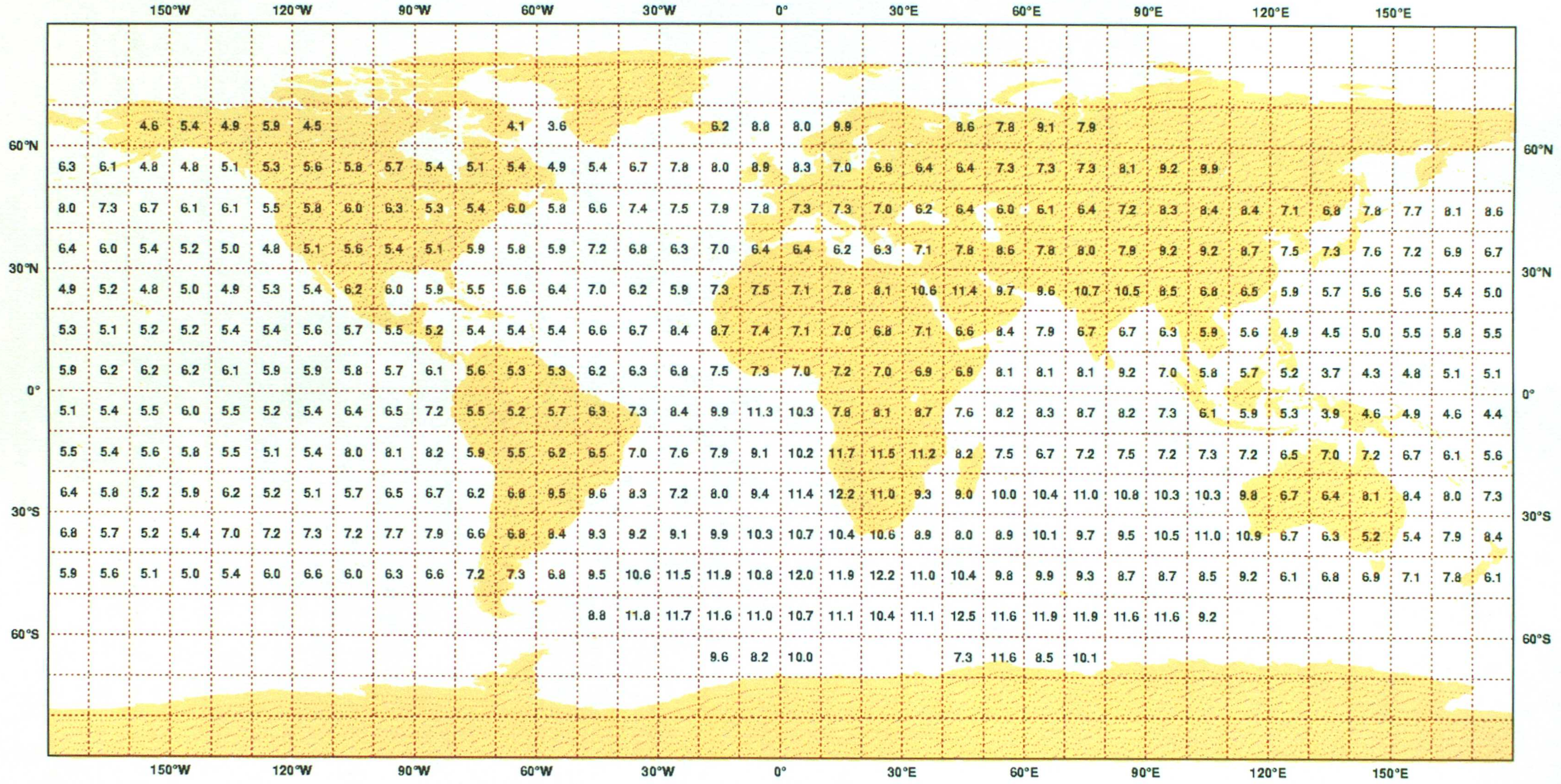

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-3.6 -2.8 -2.8 -1.6 -0.7 -0.7 -0.9 1.2 -3.0 -3.3 -6.4 -5.3 -2.6 -4.4 -3.4
-2.5 -2.4 -1.8 -2.1 -2.5 -2.5 -1.8 -1.7 -1.3 -1.1 -1.2 -0.9 -0.7 -0.2 -0.1 -0.3 -1.0 -2.0 -2.4 -1.6 -1.4 -1.8 -1.2 -1.8 -1.6 -1.7 -2.7 -3.1 -5.2
0.1 0.5 0.2 -1.1 -1.1 -1.0 -1.3 -1.6 -1.1 -1.2 -0.9 -0.7 -0.6 -1.1 -1.4 -1.1 -1.5 -1.2 -1.4 -1.7 -1.7 -1.1 -1.0 0.3 -0.5 -1.6 -2.0 -2.2 -3.0 -2.3 -1.4 -1.3 -1.9 -1.6 -1.5 0.3
0.9 1.5 0.9 0.4 0.2 0.7 -0.3 -0.7 0.4 -0.1 -0.5 -0.4 -1.0 -1.1 -0.5 -0.3 -0.6 -0.3 -0.7 -0.7 -0.9 -1.7 -2.6 -2.7 -1.8 -2.0 -3.1 -3.3 -3.0 -1.8 0.6 -0.1 -0.4 -0.4 -0.2 1.7
-0.2 -0.0 0.3 0.4 -0.1 0.2 -0.4 -0.6 -1.0 -1.4 -0.8 -1.4 -1.4 -1.8 -0.6 0.1 0.3 0.3 -0.4 -1.2 -0.9 -2.3 -3.9 -2.1 -2.3 -3.1 -3.1 -2.1 -1.3 -1.7 -0.5 -0.5 -0.2 0.1 0.5 1.1
0.3 -0.1 -0.1 0.1 0.1 -0.0 0.2 0.1 -0.9 0.0 -0.1 -0.8 -0.1 -1.0 -0.1 1.6 1.1 0.4 1.2 1.2 1.4 1.3 0.9 1.3 2.0 1.6 1.6 1.6 1.0 1.5 0.5 1.1 1.7 1.3 0.9 1.2
1.7 1.5 0.9 1.5 1.3 0.8 0.4 0.9 1.3 1.2 0.8 0.9 1.1 1.7 1.7 1.8 1.4 1.8 1.6 1.3 1.5 1.2 1.5 3.5 3.7 3.7 4.5 3.1 2.0 0.9 0.4 0.5 1.3 2.0 2.5 2.0
1.4 1.5 0.7 0.9 0.4 1.3 1.8 1.5 2.2 1.8 0.7 1.0 1.8 1.7 1.4 2.2 1.7 3.4 3.5 1.9 2.2 1.5 2.6 3.7 4.4 3.6 3.2 3.4 2.2 2.1 1.1 0.6 0.3 1.3 1.5 1.3
0.9 0.1 -0.7 -1.3 -0.8 -0.2 0.4 1.2 -0.1 -0.1 0.3 0.3 -0.1 0.2 0.7 0.6 1.2 2.6 1.0 1.8 1.3 0.9 -0.2 0.8 1.2 1.2 0.8 0.4 -0.4 -0.6 0.6 2.3 1.6 0.6 0.8 1.3
-0.4 -0.3 -0.1 -0.8 -0.2 0.3 0.4 -0.7 -0.2 0.3 -0.1 0.2 -1.2 -1.1 -0.5 -0.0 -0.2 -0.4 -1.1 -1.9 -1.6 -0.5 -0.6 -2.0 -0.9 -0.2 -1.5 -2.4 -3.1 -3.3 -0.3 0.2 1.8 0.6 -0.6 0.5
-0.9 -1.0 -0.6 -0.7 -1.4 -0.2 -0.2 -0.6 0.0 0.1 0.0 -0.2 -1.2 -2.0 -0.9 -0.4 -1.3 -1.8 -2.1 -2.2 -2.6 -2.0 -1.3 -1.4 -1.4 -2.0 -2.2 -3.0 -3.7 -3.2 -0.8 -0.2 0.2 -0.2 -1.6 -0.0
-0.9 -0.6 -0.2 -0.3 -0.8 -1.6 -0.3 -0.0 -0.6 -0.9 -1.1 -0.4 0.2 -2.3 -2.3 -2.5 -2.3 -2.7 -3.9 -3.8 -4.2 -3.6 -3.2 -2.6 -2.0 -1.7 -0.9 -1.1 -2.0 -2.5 -0.7 -1.2 -1.9 -2.2 -2.9 -1.2
-5.5 -3.9 -3.3 -3.0 -3.1 -3.2 -3.8 -4.2 -4.0 -4.4 -4.1 -3.4 -3.6 -3.8 -2.8 -1.3
-3.9 -4.9 -4.4 -3.4 -6.3 -4.2 -5.1

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). MAY 2005
All observations
Values are plotted where greater than 10 obs are present



		4.6	5.4	4.9	5.9	4.5					4.1	3.6				6.2	8.8	8.0	9.9			8.6	7.8	9.1	7.9										
6.3	6.1	4.8	4.8	5.1	5.3	5.6	5.8	5.7	5.4	5.1	5.4	4.9	5.4	6.7	7.8	8.0	8.9	8.3	7.0	6.6	6.4	6.4	7.3	7.3	7.3	8.1	9.2	9.9							
8.0	7.3	6.7	6.1	6.1	5.5	5.8	6.0	6.3	5.3	5.4	6.0	5.8	6.6	7.4	7.5	7.9	7.8	7.3	7.3	7.0	6.2	6.4	6.0	6.1	6.4	7.2	8.3	8.4	8.4	7.1	6.8	7.8	7.7	8.1	8.6
6.4	6.0	5.4	5.2	5.0	4.8	5.1	5.6	5.4	5.1	5.9	5.8	5.9	7.2	6.8	6.3	7.0	6.4	6.4	6.2	6.3	7.1	7.8	8.6	7.8	8.0	7.9	9.2	9.2	8.7	7.5	7.3	7.6	7.2	6.9	6.7
4.9	5.2	4.8	5.0	4.9	5.3	5.4	6.2	6.0	5.9	5.5	5.6	6.4	7.0	6.2	5.9	7.3	7.5	7.1	7.8	8.1	10.6	11.4	9.7	9.6	10.7	10.5	8.5	6.8	6.5	5.9	5.7	5.6	5.6	5.4	5.0
5.3	5.1	5.2	5.2	5.4	5.4	5.6	5.7	5.5	5.2	5.4	5.4	5.4	6.6	6.7	8.4	8.7	7.4	7.1	7.0	6.8	7.1	6.6	8.4	7.9	6.7	6.7	6.3	5.9	5.6	4.9	4.5	5.0	5.5	5.8	5.5
5.9	6.2	6.2	6.2	6.1	5.9	5.9	5.8	5.7	6.1	5.6	5.3	5.3	6.2	6.3	6.8	7.5	7.3	7.0	7.2	7.0	6.9	6.9	8.1	8.1	8.1	9.2	7.0	5.8	5.7	5.2	3.7	4.3	4.8	5.1	5.1
5.1	5.4	5.5	6.0	5.5	5.2	5.4	6.4	6.5	7.2	5.5	5.2	5.7	6.3	7.3	8.4	9.9	11.3	10.3	7.8	8.1	8.7	7.6	8.2	8.3	8.7	8.2	7.3	6.1	5.9	5.3	3.9	4.6	4.9	4.6	4.4
5.5	5.4	5.6	5.8	5.5	5.1	5.4	8.0	8.1	8.2	5.9	5.5	6.2	6.5	7.0	7.6	7.9	9.1	10.2	11.7	11.5	11.2	8.2	7.5	6.7	7.2	7.5	7.2	7.3	7.2	6.5	7.0	7.2	6.7	6.1	5.6
6.4	5.8	5.2	5.9	6.2	5.2	5.1	5.7	6.5	6.7	6.2	6.8	9.5	9.6	8.3	7.2	8.0	9.4	11.4	12.2	11.0	9.3	9.0	10.0	10.4	11.0	10.8	10.3	10.3	9.8	6.7	6.4	8.1	8.4	8.0	7.3
6.8	5.7	5.2	5.4	7.0	7.2	7.3	7.2	7.7	7.9	6.6	6.8	8.4	9.3	9.2	9.1	9.9	10.3	10.7	10.4	10.6	8.9	8.0	8.9	10.1	9.7	9.5	10.5	11.0	10.9	6.7	6.3	5.2	5.4	7.9	8.4
5.9	5.6	5.1	5.0	5.4	6.0	6.6	6.0	6.3	6.6	7.2	7.3	6.8	9.5	10.6	11.5	11.9	10.8	12.0	11.9	12.2	11.0	10.4	9.8	9.9	9.3	8.7	8.7	8.5	9.2	6.1	6.8	6.9	7.1	7.8	6.1
													8.8	11.8	11.7	11.6	11.0	10.7	11.1	10.4	11.1	12.5	11.6	11.9	11.9	11.6	11.6	9.2							
																9.6	8.2	10.0				7.3	11.6	8.5	10.1										

MONITORING OF SATELLITE TEMPERATURES

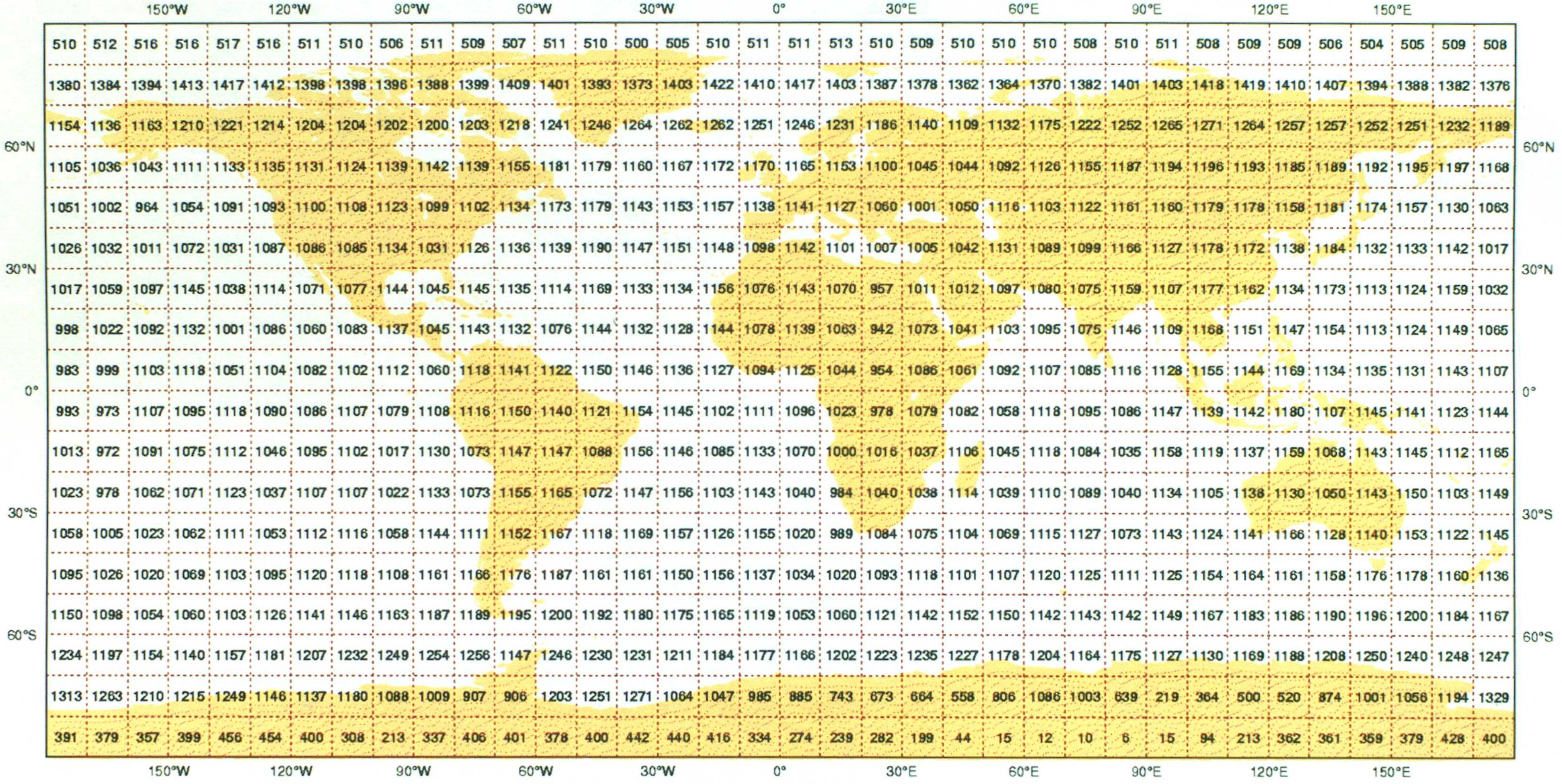
MONITORING CENTRE: EXETER

MONTH: May 2005

Monitoring procedures

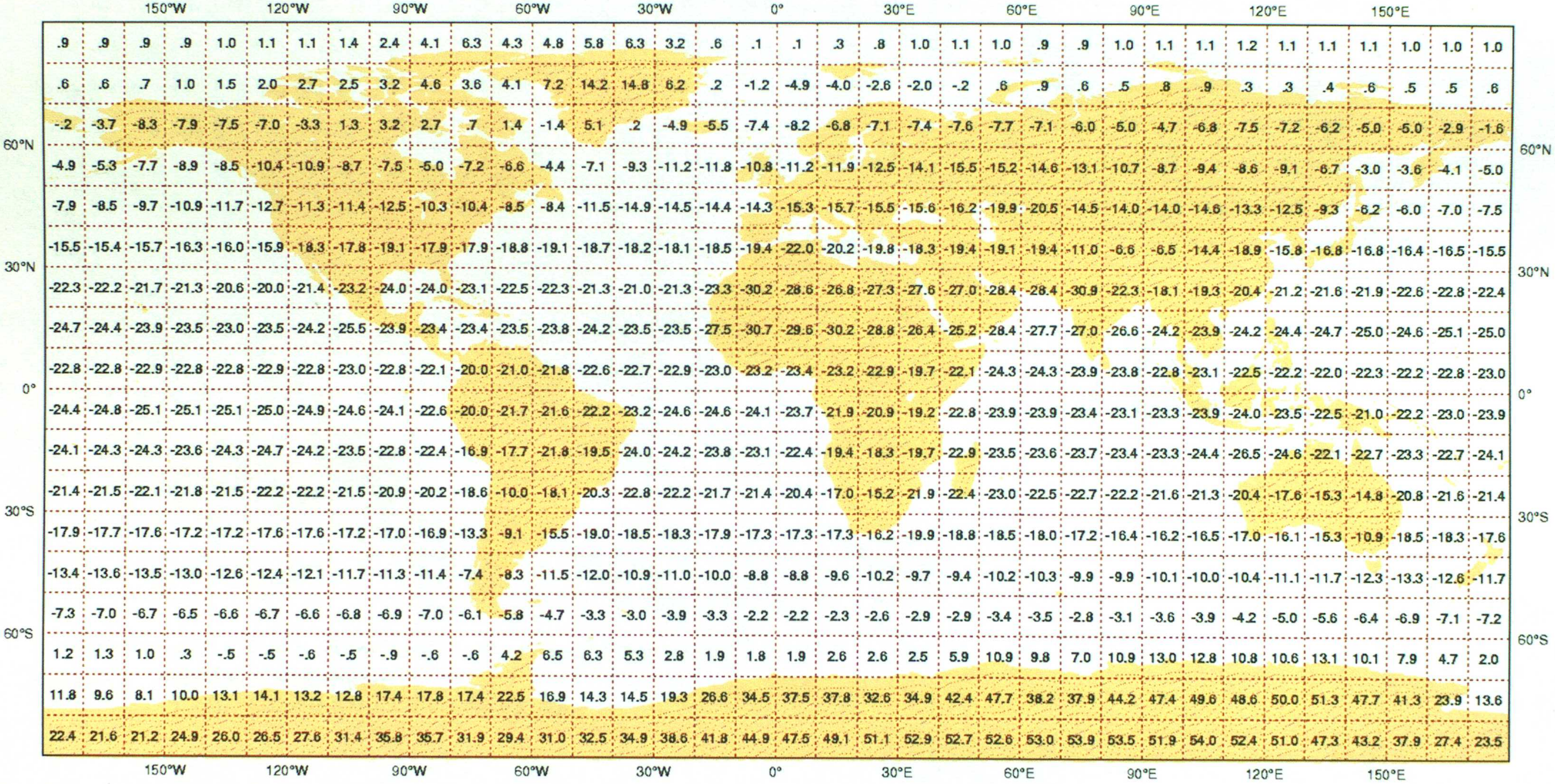
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100) :Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. MAY 2005
NOAA15, using all observations
Global average number of observations in 24 hours = 680611



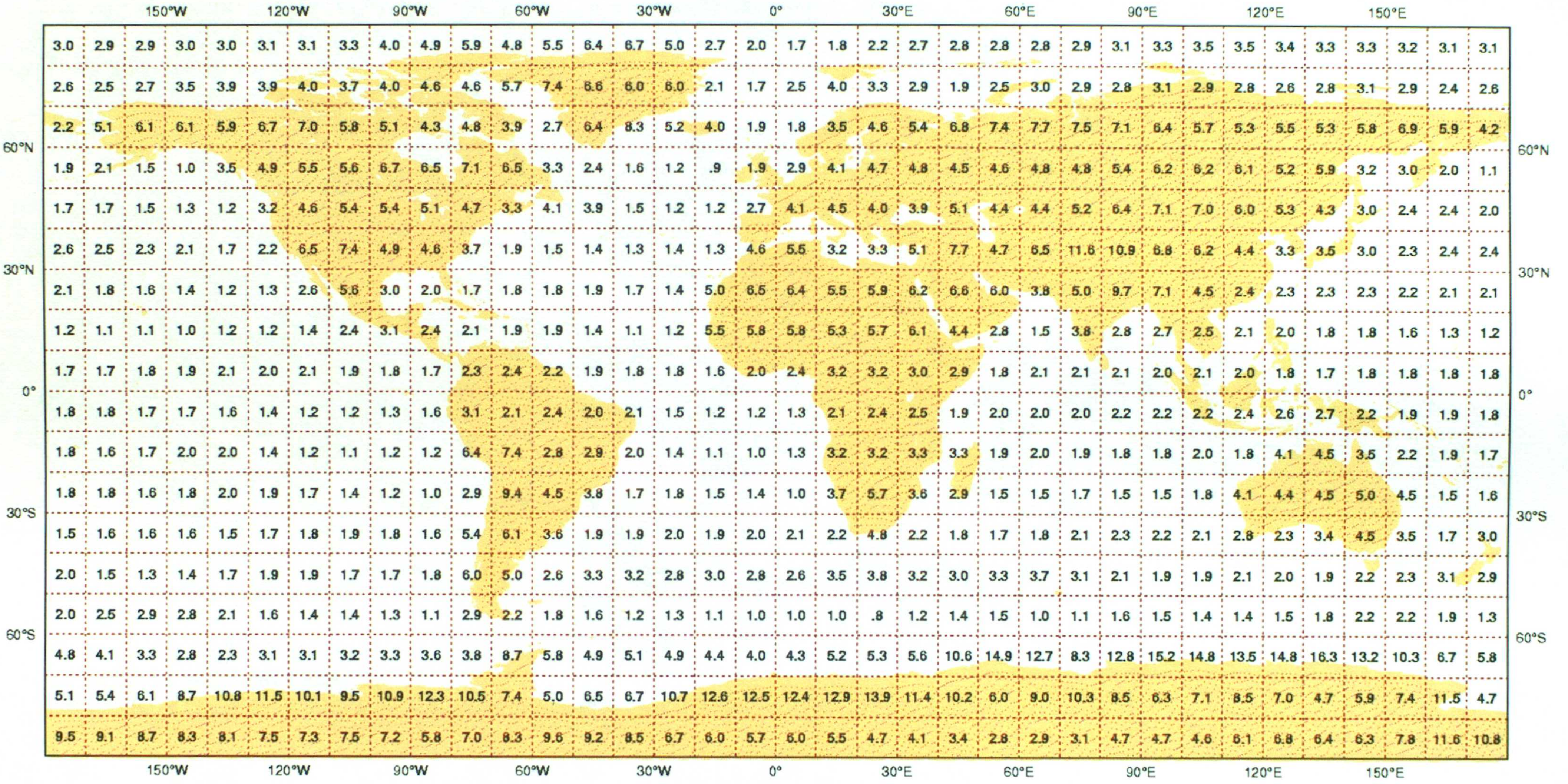
510	512	516	516	517	516	511	510	506	511	509	507	511	510	500	505	510	511	511	513	510	509	510	510	510	508	510	511	508	509	509	506	504	505	509	508
1380	1384	1394	1413	1417	1412	1398	1398	1396	1388	1399	1409	1401	1393	1373	1403	1422	1410	1417	1403	1387	1378	1362	1364	1370	1382	1401	1403	1418	1419	1410	1407	1394	1388	1382	1376
1154	1136	1163	1210	1221	1214	1204	1204	1202	1200	1203	1218	1241	1246	1264	1262	1262	1251	1246	1231	1186	1140	1109	1132	1175	1222	1252	1265	1271	1264	1257	1257	1252	1251	1232	1189
1105	1036	1043	1111	1133	1135	1131	1124	1139	1142	1139	1155	1181	1179	1160	1167	1172	1170	1165	1153	1100	1045	1044	1092	1126	1155	1187	1194	1196	1193	1185	1189	1192	1195	1197	1168
1051	1002	964	1054	1091	1093	1100	1108	1123	1099	1102	1134	1173	1179	1143	1153	1157	1138	1141	1127	1060	1001	1050	1116	1103	1122	1161	1160	1179	1178	1158	1181	1174	1157	1130	1063
1026	1032	1011	1072	1031	1087	1086	1085	1134	1031	1126	1136	1139	1190	1147	1151	1148	1098	1142	1101	1007	1005	1042	1131	1089	1099	1166	1127	1178	1172	1138	1184	1132	1133	1142	1017
1017	1059	1097	1145	1038	1114	1071	1077	1144	1045	1145	1135	1114	1169	1133	1134	1156	1076	1143	1070	957	1011	1012	1097	1080	1075	1159	1107	1177	1162	1134	1173	1113	1124	1159	1032
998	1022	1092	1132	1001	1086	1060	1083	1137	1045	1143	1132	1076	1144	1132	1128	1144	1078	1139	1063	942	1073	1041	1103	1095	1075	1146	1109	1168	1151	1147	1154	1113	1124	1149	1065
983	999	1103	1118	1051	1104	1082	1102	1112	1060	1118	1141	1122	1150	1146	1136	1127	1094	1125	1044	954	1086	1061	1092	1107	1085	1116	1128	1155	1144	1169	1134	1135	1131	1143	1107
993	973	1107	1095	1118	1090	1086	1107	1079	1108	1116	1150	1140	1121	1154	1145	1102	1111	1096	1023	978	1079	1082	1058	1118	1095	1086	1147	1139	1142	1180	1107	1145	1141	1123	1144
1013	972	1091	1075	1112	1046	1095	1102	1017	1130	1073	1147	1147	1088	1156	1146	1085	1133	1070	1000	1016	1037	1106	1045	1118	1084	1035	1158	1119	1137	1159	1068	1143	1145	1112	1165
1023	978	1062	1071	1123	1037	1107	1107	1022	1133	1073	1155	1165	1072	1147	1156	1103	1143	1040	984	1040	1038	1114	1039	1110	1089	1040	1134	1105	1138	1130	1050	1143	1150	1103	1149
1058	1005	1023	1062	1111	1053	1112	1116	1058	1144	1111	1152	1167	1118	1169	1157	1126	1155	1020	989	1084	1075	1104	1069	1115	1127	1073	1143	1124	1141	1166	1128	1140	1153	1122	1145
1095	1026	1020	1069	1103	1095	1120	1118	1108	1161	1166	1176	1187	1161	1161	1150	1156	1137	1034	1020	1093	1118	1101	1107	1120	1125	1111	1125	1154	1164	1161	1158	1176	1178	1160	1136
1150	1098	1054	1060	1103	1126	1141	1146	1163	1187	1189	1195	1200	1192	1180	1175	1165	1119	1053	1060	1121	1142	1152	1150	1142	1143	1142	1149	1167	1183	1186	1190	1196	1200	1184	1167
1234	1197	1154	1140	1157	1181	1207	1232	1249	1254	1256	1147	1246	1230	1231	1211	1184	1177	1166	1202	1223	1235	1227	1178	1204	1164	1175	1127	1130	1169	1188	1208	1250	1240	1248	1247
1313	1263	1210	1215	1249	1146	1137	1180	1088	1009	907	906	1203	1251	1271	1064	1047	985	885	743	673	664	558	806	1086	1003	639	219	364	500	520	874	1001	1056	1194	1329
391	379	357	399	456	454	400	308	213	337	406	401	378	400	442	440	416	334	274	239	282	199	44	15	12	10	6	15	94	213	362	361	359	379	428	400

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS8 (Surface)
NOAA15, using all observations



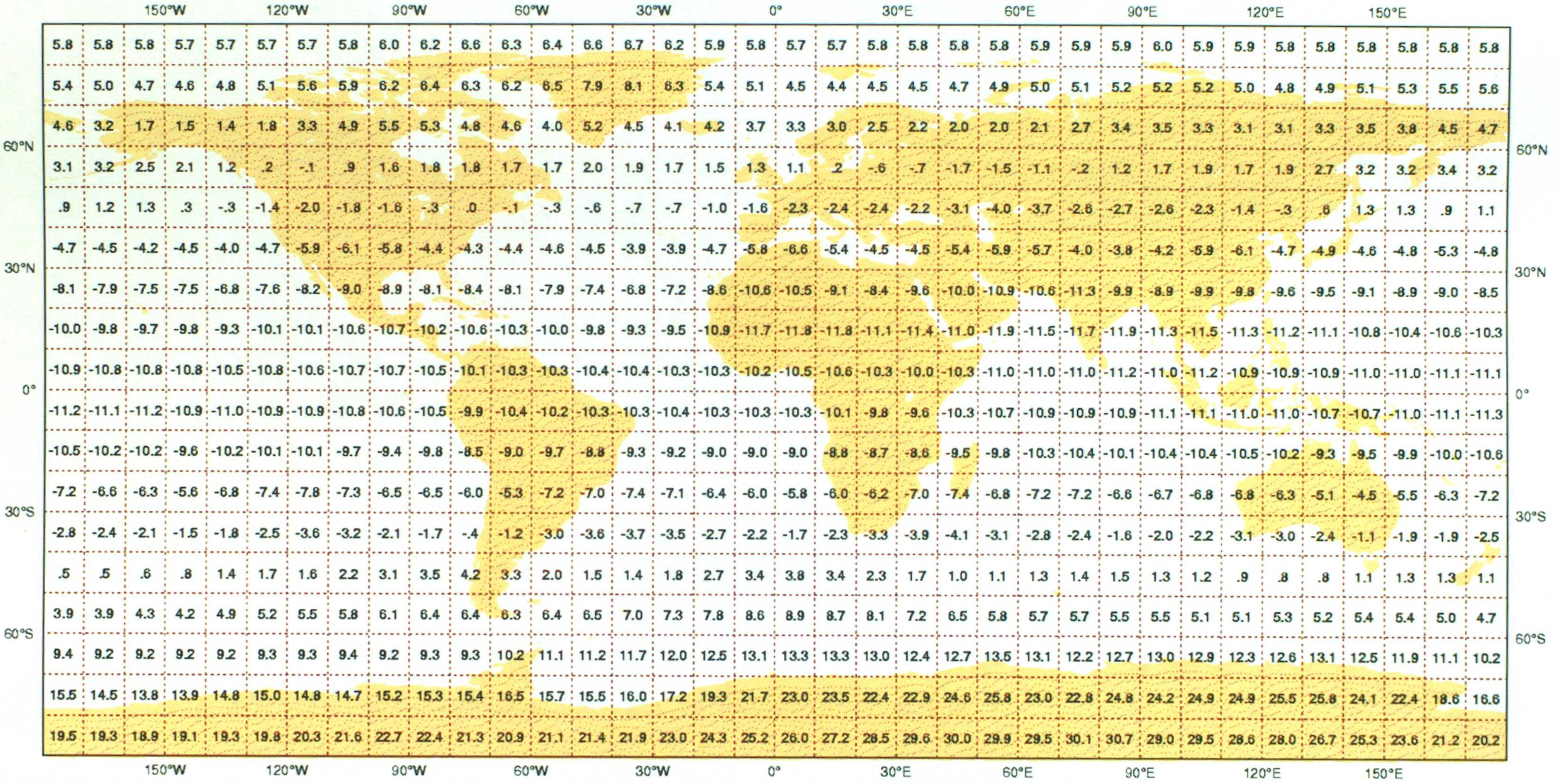
.9	.9	.9	.9	1.0	1.1	1.1	1.4	2.4	4.1	6.3	4.3	4.8	5.8	6.3	3.2	.6	.1	.1	.3	.8	1.0	1.1	1.0	.9	.9	1.0	1.1	1.1	1.2	1.1	1.1	1.1	1.0	1.0	1.0
.6	.6	.7	1.0	1.5	2.0	2.7	2.5	3.2	4.6	3.6	4.1	7.2	14.2	14.8	6.2	.2	-1.2	-4.9	-4.0	-2.6	-2.0	-.2	.6	.9	.6	.5	.8	.9	.3	.3	.4	.6	.5	.5	.6
-.2	-3.7	-8.3	-7.9	-7.5	-7.0	-3.3	1.3	3.2	2.7	.7	1.4	-1.4	5.1	.2	-4.9	-5.5	-7.4	-8.2	-6.8	-7.1	-7.4	-7.6	-7.7	-7.1	-6.0	-5.0	-4.7	-6.8	-7.5	-7.2	-6.2	-5.0	-5.0	-2.9	-1.6
-4.9	-5.3	-7.7	-8.9	-8.5	-10.4	-10.9	-8.7	-7.5	-5.0	-7.2	-6.6	-4.4	-7.1	-9.3	-11.2	-11.8	-10.8	-11.2	-11.9	-12.5	-14.1	-15.5	-15.2	-14.6	-13.1	-10.7	-8.7	-9.4	-8.6	-9.1	-6.7	-3.0	-3.6	-4.1	-5.0
-7.9	-8.5	-9.7	-10.9	-11.7	-12.7	-11.3	-11.4	-12.5	-10.3	-10.4	-8.5	-8.4	-11.5	-14.9	-14.5	-14.4	-14.3	-15.3	-15.7	-15.5	-15.6	-16.2	-19.9	-20.5	-14.5	-14.0	-14.0	-14.6	-13.3	-12.5	-9.3	-6.2	-6.0	-7.0	-7.5
-15.5	-15.4	-15.7	-16.3	-16.0	-15.9	-18.3	-17.8	-19.1	-17.9	-17.9	-18.8	-19.1	-18.7	-18.2	-18.1	-18.5	-19.4	-22.0	-20.2	-19.8	-18.3	-19.4	-19.1	-19.4	-11.0	-6.6	-6.5	-14.4	-18.9	-15.8	-16.8	-16.8	-16.4	-16.5	-15.5
-22.3	-22.2	-21.7	-21.3	-20.6	-20.0	-21.4	-23.2	-24.0	-24.0	-23.1	-22.5	-22.3	-21.3	-21.0	-21.3	-23.3	-30.2	-28.6	-26.8	-27.3	-27.6	-27.0	-28.4	-28.4	-30.9	-22.3	-18.1	-19.3	-20.4	-21.2	-21.6	-21.9	-22.6	-22.8	-22.4
-24.7	-24.4	-23.9	-23.5	-23.0	-23.5	-24.2	-25.5	-23.9	-23.4	-23.4	-23.5	-23.8	-24.2	-23.5	-23.5	-27.5	-30.7	-29.6	-30.2	-28.8	-26.4	-25.2	-28.4	-27.7	-27.0	-26.6	-24.2	-23.9	-24.2	-24.4	-24.7	-25.0	-24.6	-25.1	-25.0
-22.8	-22.8	-22.9	-22.8	-22.8	-22.9	-22.8	-23.0	-22.8	-22.1	-20.0	-21.0	-21.8	-22.6	-22.7	-22.9	-23.0	-23.2	-23.4	-23.2	-22.9	-19.7	-22.1	-24.3	-24.3	-23.9	-23.8	-22.8	-23.1	-22.5	-22.2	-22.0	-22.3	-22.2	-22.8	-23.0
-24.4	-24.8	-25.1	-25.1	-25.1	-25.0	-24.9	-24.6	-24.1	-22.6	-20.0	-21.7	-21.6	-22.2	-23.2	-24.6	-24.6	-24.1	-23.7	-21.9	-20.9	-19.2	-22.8	-23.9	-23.9	-23.4	-23.1	-23.3	-23.9	-24.0	-23.5	-22.5	-21.0	-22.2	-23.0	-23.9
-24.1	-24.3	-24.3	-23.6	-24.3	-24.7	-24.2	-23.5	-22.8	-22.4	-16.9	-17.7	-21.8	-19.5	-24.0	-24.2	-23.8	-23.1	-22.4	-19.4	-18.3	-19.7	-22.9	-23.5	-23.6	-23.7	-23.4	-23.3	-24.4	-26.5	-24.6	-22.1	-22.7	-23.3	-22.7	-24.1
-21.4	-21.5	-22.1	-21.8	-21.5	-22.2	-22.2	-21.5	-20.9	-20.2	-18.6	-10.0	-18.1	-20.3	-22.8	-22.2	-21.7	-21.4	-20.4	-17.0	-15.2	-21.9	-22.4	-23.0	-22.5	-22.7	-22.2	-21.6	-21.3	-20.4	-17.6	-15.3	-14.8	-20.8	-21.6	-21.4
-17.9	-17.7	-17.6	-17.2	-17.2	-17.6	-17.6	-17.2	-17.0	-16.9	-13.3	-9.1	-15.5	-19.0	-18.5	-18.3	-17.9	-17.3	-17.3	-17.3	-16.2	-19.9	-18.8	-18.5	-18.0	-17.2	-16.4	-16.2	-16.5	-17.0	-16.1	-15.3	-10.9	-18.5	-18.3	-17.6
-13.4	-13.6	-13.5	-13.0	-12.6	-12.4	-12.1	-11.7	-11.3	-11.4	-7.4	-8.3	-11.5	-12.0	-10.9	-11.0	-10.0	-8.8	-8.8	-9.6	-10.2	-9.7	-9.4	-10.2	-10.3	-9.9	-9.9	-10.1	-10.0	-10.4	-11.1	-11.7	-12.3	-13.3	-12.6	-11.7
-7.3	-7.0	-6.7	-6.5	-6.6	-6.7	-6.6	-6.8	-6.9	-7.0	-6.1	-5.8	-4.7	-3.3	-3.0	-3.9	-3.3	-2.2	-2.2	-2.3	-2.6	-2.9	-2.9	-3.4	-3.5	-2.8	-3.1	-3.6	-3.9	-4.2	-5.0	-5.6	-6.4	-6.9	-7.1	-7.2
1.2	1.3	1.0	.3	-.5	-.5	-.6	-.5	-.9	-.6	-.6	4.2	6.5	6.3	5.3	2.8	1.9	1.8	1.9	2.6	2.6	2.5	5.9	10.9	9.8	7.0	10.9	13.0	12.8	10.8	10.6	13.1	10.1	7.9	4.7	2.0
11.8	9.6	8.1	10.0	13.1	14.1	13.2	12.8	17.4	17.8	17.4	22.5	16.9	14.3	14.5	19.3	26.6	34.5	37.5	37.8	32.6	34.9	42.4	47.7	38.2	37.9	44.2	47.4	49.6	48.6	50.0	51.3	47.7	41.3	23.9	13.6
22.4	21.6	21.2	24.9	26.0	26.5	27.6	31.4	35.8	35.7	31.9	29.4	31.0	32.5	34.9	38.6	41.8	44.9	47.5	49.1	51.1	52.9	52.7	52.6	53.0	53.9	53.5	51.9	54.0	52.4	51.0	47.3	43.2	37.9	27.4	23.5

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS8 (Surface)
NOAA15, using all observations



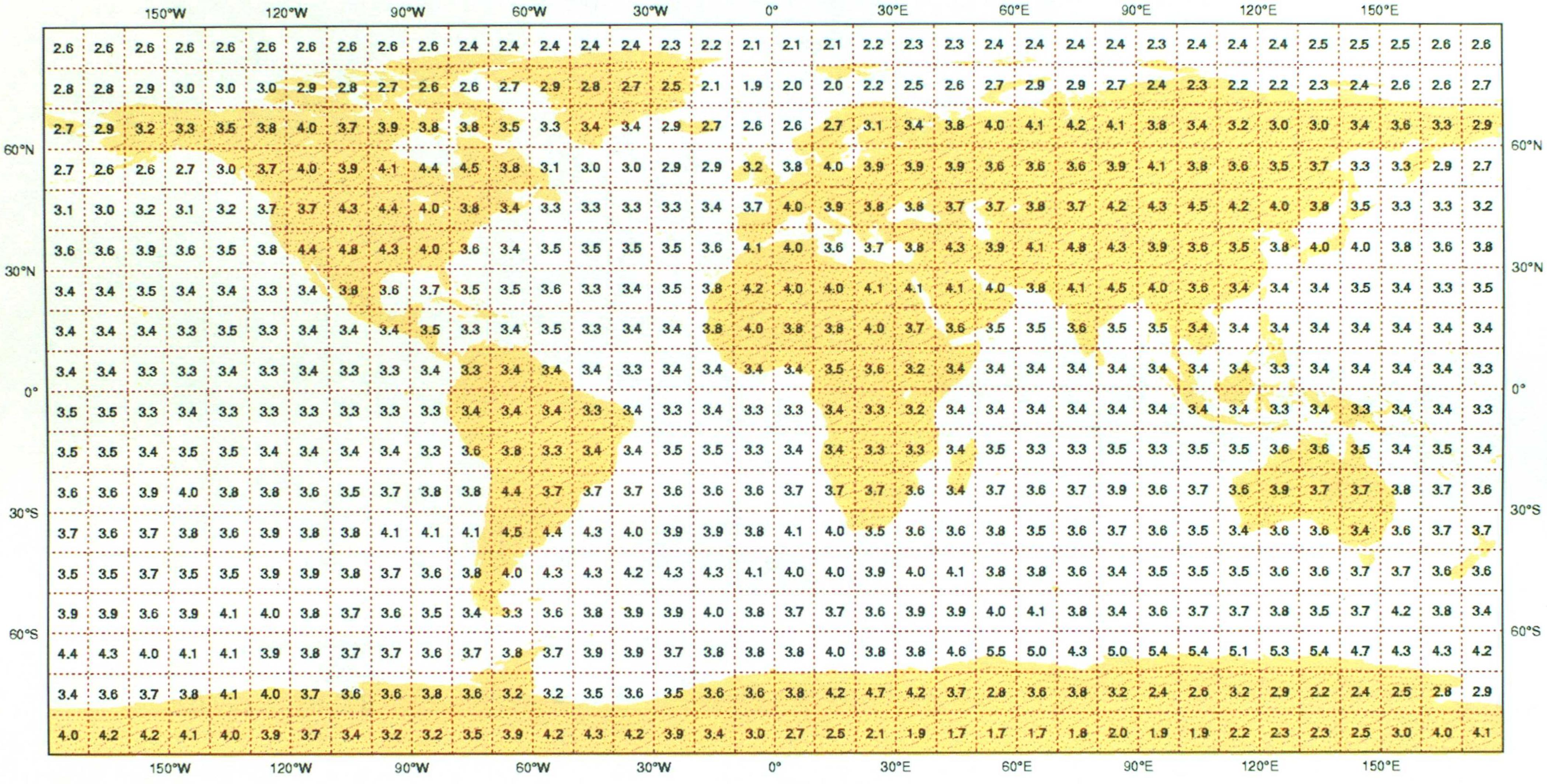
3.0	2.9	2.9	3.0	3.0	3.1	3.1	3.3	4.0	4.9	5.9	4.8	5.5	6.4	6.7	5.0	2.7	2.0	1.7	1.8	2.2	2.7	2.8	2.8	2.8	2.9	3.1	3.3	3.5	3.5	3.4	3.3	3.3	3.2	3.1	3.1
2.6	2.5	2.7	3.5	3.9	3.9	4.0	3.7	4.0	4.6	4.6	5.7	7.4	6.6	6.0	6.0	2.1	1.7	2.5	4.0	3.3	2.9	1.9	2.5	3.0	2.9	2.8	3.1	2.9	2.8	2.6	2.8	3.1	2.9	2.4	2.6
2.2	5.1	6.1	6.1	5.9	6.7	7.0	5.8	5.1	4.3	4.8	3.9	2.7	6.4	8.3	5.2	4.0	1.9	1.8	3.5	4.6	5.4	6.8	7.4	7.7	7.5	7.1	6.4	5.7	5.3	5.5	5.3	5.8	6.9	5.9	4.2
1.9	2.1	1.5	1.0	3.5	4.9	5.5	5.6	6.7	6.5	7.1	6.5	3.3	2.4	1.6	1.2	.9	1.9	2.9	4.1	4.7	4.8	4.5	4.6	4.8	4.8	5.4	6.2	6.2	6.1	5.2	5.9	3.2	3.0	2.0	1.1
1.7	1.7	1.5	1.3	1.2	3.2	4.6	5.4	5.4	5.1	4.7	3.3	4.1	3.9	1.5	1.2	1.2	2.7	4.1	4.5	4.0	3.9	5.1	4.4	4.4	5.2	6.4	7.1	7.0	6.0	5.3	4.3	3.0	2.4	2.4	2.0
2.6	2.5	2.3	2.1	1.7	2.2	6.5	7.4	4.9	4.6	3.7	1.9	1.5	1.4	1.3	1.4	1.3	4.6	5.5	3.2	3.3	5.1	7.7	4.7	6.5	11.6	10.9	6.8	6.2	4.4	3.3	3.5	3.0	2.3	2.4	2.4
2.1	1.8	1.6	1.4	1.2	1.3	2.6	5.6	3.0	2.0	1.7	1.8	1.8	1.9	1.7	1.4	5.0	6.5	6.4	5.5	5.9	6.2	6.6	6.0	3.8	5.0	9.7	7.1	4.5	2.4	2.3	2.3	2.3	2.2	2.1	2.1
1.2	1.1	1.1	1.0	1.2	1.2	1.4	2.4	3.1	2.4	2.1	1.9	1.9	1.4	1.1	1.2	5.5	5.8	5.8	5.3	5.7	6.1	4.4	2.8	1.5	3.8	2.8	2.7	2.5	2.1	2.0	1.8	1.8	1.6	1.3	1.2
1.7	1.7	1.8	1.9	2.1	2.0	2.1	1.9	1.8	1.7	2.3	2.4	2.2	1.9	1.8	1.8	1.6	2.0	2.4	3.2	3.2	3.0	2.9	1.8	2.1	2.1	2.1	2.0	2.1	2.0	1.8	1.7	1.8	1.8	1.8	1.8
1.8	1.8	1.7	1.7	1.6	1.4	1.2	1.2	1.3	1.6	3.1	2.1	2.4	2.0	2.1	1.5	1.2	1.2	1.3	2.1	2.4	2.5	1.9	2.0	2.0	2.0	2.2	2.2	2.2	2.4	2.6	2.7	2.2	1.9	1.9	1.8
1.8	1.6	1.7	2.0	2.0	1.4	1.2	1.1	1.2	1.2	6.4	7.4	2.8	2.9	2.0	1.4	1.1	1.0	1.3	3.2	3.2	3.3	3.3	1.9	2.0	1.9	1.8	1.8	2.0	1.8	4.1	4.5	3.5	2.2	1.9	1.7
1.8	1.8	1.6	1.8	2.0	1.9	1.7	1.4	1.2	1.0	2.9	9.4	4.5	3.8	1.7	1.8	1.5	1.4	1.0	3.7	5.7	3.6	2.9	1.5	1.5	1.7	1.5	1.5	1.8	4.1	4.4	4.5	5.0	4.5	1.5	1.6
1.5	1.6	1.6	1.6	1.5	1.7	1.8	1.9	1.8	1.6	5.4	6.1	3.6	1.9	1.9	2.0	1.9	2.0	2.1	2.2	4.8	2.2	1.8	1.7	1.8	2.1	2.3	2.2	2.1	2.8	2.3	3.4	4.5	3.5	1.7	3.0
2.0	1.5	1.3	1.4	1.7	1.9	1.9	1.7	1.7	1.8	6.0	5.0	2.6	3.3	3.2	2.8	3.0	2.8	2.6	3.5	3.8	3.2	3.0	3.3	3.7	3.1	2.1	1.9	1.9	2.1	2.0	1.9	2.2	2.3	3.1	2.9
2.0	2.5	2.9	2.8	2.1	1.6	1.4	1.4	1.3	1.1	2.9	2.2	1.8	1.6	1.2	1.3	1.1	1.0	1.0	1.0	.8	1.2	1.4	1.5	1.0	1.1	1.6	1.5	1.4	1.4	1.5	1.8	2.2	2.2	1.9	1.3
4.8	4.1	3.3	2.8	2.3	3.1	3.1	3.2	3.3	3.6	3.8	8.7	5.8	4.9	5.1	4.9	4.4	4.0	4.3	5.2	5.3	5.6	10.6	14.9	12.7	8.3	12.8	15.2	14.8	13.5	14.8	16.3	13.2	10.3	6.7	5.8
5.1	5.4	6.1	8.7	10.8	11.5	10.1	9.5	10.9	12.3	10.5	7.4	5.0	6.5	6.7	10.7	12.6	12.5	12.4	12.9	13.9	11.4	10.2	6.0	9.0	10.3	8.5	6.3	7.1	8.5	7.0	4.7	5.9	7.4	11.5	4.7
9.5	9.1	8.7	8.3	8.1	7.5	7.3	7.5	7.2	5.8	7.0	8.3	9.6	9.2	8.5	6.7	6.0	5.7	6.0	5.5	4.7	4.1	3.4	2.8	2.9	3.1	4.7	4.7	4.6	6.1	6.8	6.4	6.3	7.8	11.6	10.8

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



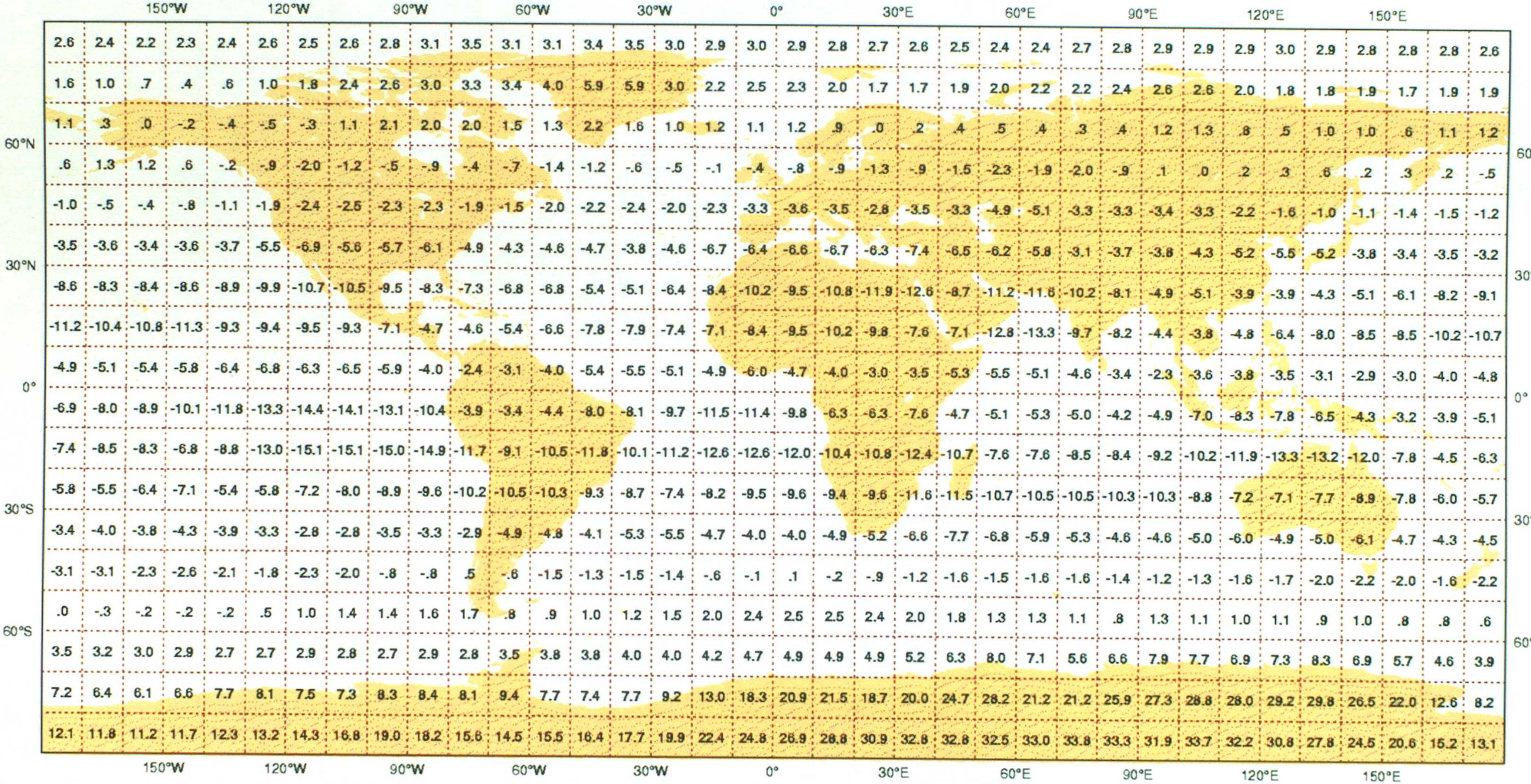
5.8	5.8	5.8	5.7	5.7	5.7	5.7	5.8	6.0	6.2	6.6	6.3	6.4	6.6	6.7	6.2	5.9	5.8	5.7	5.7	5.8	5.8	5.8	5.8	5.9	5.9	5.9	6.0	5.9	5.9	5.8	5.8	5.8	5.8	5.8	5.8
5.4	5.0	4.7	4.6	4.8	5.1	5.6	5.9	6.2	6.4	6.3	6.2	6.5	7.9	8.1	6.3	5.4	5.1	4.5	4.4	4.5	4.5	4.7	4.9	5.0	5.1	5.2	5.2	5.2	5.0	4.8	4.9	5.1	5.3	5.5	5.6
4.6	3.2	1.7	1.5	1.4	1.8	3.3	4.9	5.5	5.3	4.8	4.6	4.0	5.2	4.5	4.1	4.2	3.7	3.3	3.0	2.5	2.2	2.0	2.0	2.1	2.7	3.4	3.5	3.3	3.1	3.1	3.3	3.5	3.8	4.5	4.7
3.1	3.2	2.5	2.1	1.2	.2	-.1	.9	1.6	1.8	1.8	1.7	1.7	2.0	1.9	1.7	1.5	1.3	1.1	.2	-.6	-.7	-1.7	-1.5	-1.1	-.2	1.2	1.7	1.9	1.7	1.9	2.7	3.2	3.2	3.4	3.2
.9	1.2	1.3	.3	-.3	-1.4	-2.0	-1.8	-1.6	-.3	.0	-.1	-.3	-.6	-.7	-.7	-1.0	-1.6	-2.3	-2.4	-2.4	-2.2	-3.1	-4.0	-3.7	-2.6	-2.7	-2.6	-2.3	-1.4	-.3	.6	1.3	1.3	.9	1.1
-4.7	-4.5	-4.2	-4.5	-4.0	-4.7	-5.9	-6.1	-5.8	-4.4	-4.3	-4.4	-4.6	-4.5	-3.9	-3.9	-4.7	-5.8	-6.6	-5.4	-4.5	-4.5	-5.4	-5.9	-5.7	-4.0	-3.8	-4.2	-5.9	-6.1	-4.7	-4.9	-4.6	-4.8	-5.3	-4.8
-8.1	-7.9	-7.5	-7.5	-6.8	-7.6	-8.2	-9.0	-8.9	-8.1	-8.4	-8.1	-7.9	-7.4	-6.8	-7.2	-8.6	-10.6	-10.5	-9.1	-8.4	-9.6	-10.0	-10.9	-10.6	-11.3	-9.9	-8.9	-9.9	-9.8	-9.6	-9.5	-9.1	-8.9	-9.0	-8.5
-10.0	-9.8	-9.7	-9.8	-9.3	-10.1	-10.1	-10.6	-10.7	-10.2	-10.6	-10.3	-10.0	-9.8	-9.3	-9.5	-10.9	-11.7	-11.8	-11.8	-11.1	-11.4	-11.0	-11.9	-11.5	-11.7	-11.9	-11.3	-11.5	-11.3	-11.2	-11.1	-10.8	-10.4	-10.6	-10.3
-10.9	-10.8	-10.8	-10.8	-10.5	-10.8	-10.6	-10.7	-10.7	-10.5	-10.1	-10.3	-10.3	-10.4	-10.4	-10.3	-10.3	-10.2	-10.5	-10.6	-10.3	-10.0	-10.3	-11.0	-11.0	-11.0	-11.2	-11.0	-11.2	-10.9	-10.9	-10.9	-11.0	-11.0	-11.1	-11.1
-11.2	-11.1	-11.2	-10.9	-11.0	-10.9	-10.9	-10.8	-10.6	-10.5	-9.9	-10.4	-10.2	-10.3	-10.3	-10.4	-10.3	-10.3	-10.3	-10.1	-9.8	-9.6	-10.3	-10.7	-10.9	-10.9	-10.9	-11.1	-11.1	-11.0	-11.0	-10.7	-10.7	-11.0	-11.1	-11.3
-10.5	-10.2	-10.2	-9.6	-10.2	-10.1	-10.1	-9.7	-9.4	-9.8	-8.5	-9.0	-9.7	-8.8	-9.3	-9.2	-9.0	-9.0	-9.0	-8.8	-8.7	-8.6	-9.5	-9.8	-10.3	-10.4	-10.1	-10.4	-10.4	-10.5	-10.2	-9.3	-9.5	-9.9	-10.0	-10.6
-7.2	-6.6	-6.3	-5.6	-6.8	-7.4	-7.8	-7.3	-6.5	-6.5	-6.0	-5.3	-7.2	-7.0	-7.4	-7.1	-6.4	-6.0	-5.8	-6.0	-6.2	-7.0	-7.4	-6.8	-7.2	-7.2	-6.6	-6.7	-6.8	-6.8	-6.3	-5.1	-4.5	-5.5	-6.3	-7.2
-2.8	-2.4	-2.1	-1.5	-1.8	-2.5	-3.6	-3.2	-2.1	-1.7	-.4	-1.2	-3.0	-3.6	-3.7	-3.5	-2.7	-2.2	-1.7	-2.3	-3.3	-3.9	-4.1	-3.1	-2.8	-2.4	-1.6	-2.0	-2.2	-3.1	-3.0	-2.4	-1.1	-1.9	-1.9	-2.5
.5	.5	.6	.8	1.4	1.7	1.6	2.2	3.1	3.5	4.2	3.3	2.0	1.5	1.4	1.8	2.7	3.4	3.8	3.4	2.3	1.7	1.0	1.1	1.3	1.4	1.5	1.3	1.2	.9	.8	.8	1.1	1.3	1.3	1.1
3.9	3.9	4.3	4.2	4.9	5.2	5.5	5.8	6.1	6.4	6.4	6.3	6.4	6.5	7.0	7.3	7.8	8.6	8.9	8.7	8.1	7.2	6.5	5.8	5.7	5.7	5.5	5.5	5.1	5.1	5.3	5.2	5.4	5.4	5.0	4.7
9.4	9.2	9.2	9.2	9.2	9.3	9.3	9.4	9.2	9.3	9.3	10.2	11.1	11.2	11.7	12.0	12.5	13.1	13.3	13.3	13.0	12.4	12.7	13.5	13.1	12.2	12.7	13.0	12.9	12.3	12.6	13.1	12.5	11.9	11.1	10.2
15.5	14.5	13.8	13.9	14.8	15.0	14.8	14.7	15.2	15.3	15.4	16.5	15.7	15.5	16.0	17.2	19.3	21.7	23.0	23.5	22.4	22.9	24.6	25.8	23.0	22.8	24.8	24.2	24.9	24.9	25.5	25.8	24.1	22.4	18.6	16.6
19.5	19.3	18.9	19.1	19.3	19.8	20.3	21.6	22.7	22.4	21.3	20.9	21.1	21.4	21.9	23.0	24.3	25.2	26.0	27.2	28.5	29.6	30.0	29.9	29.5	30.1	30.7	29.0	29.5	28.6	28.0	26.7	25.3	23.6	21.2	20.2

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



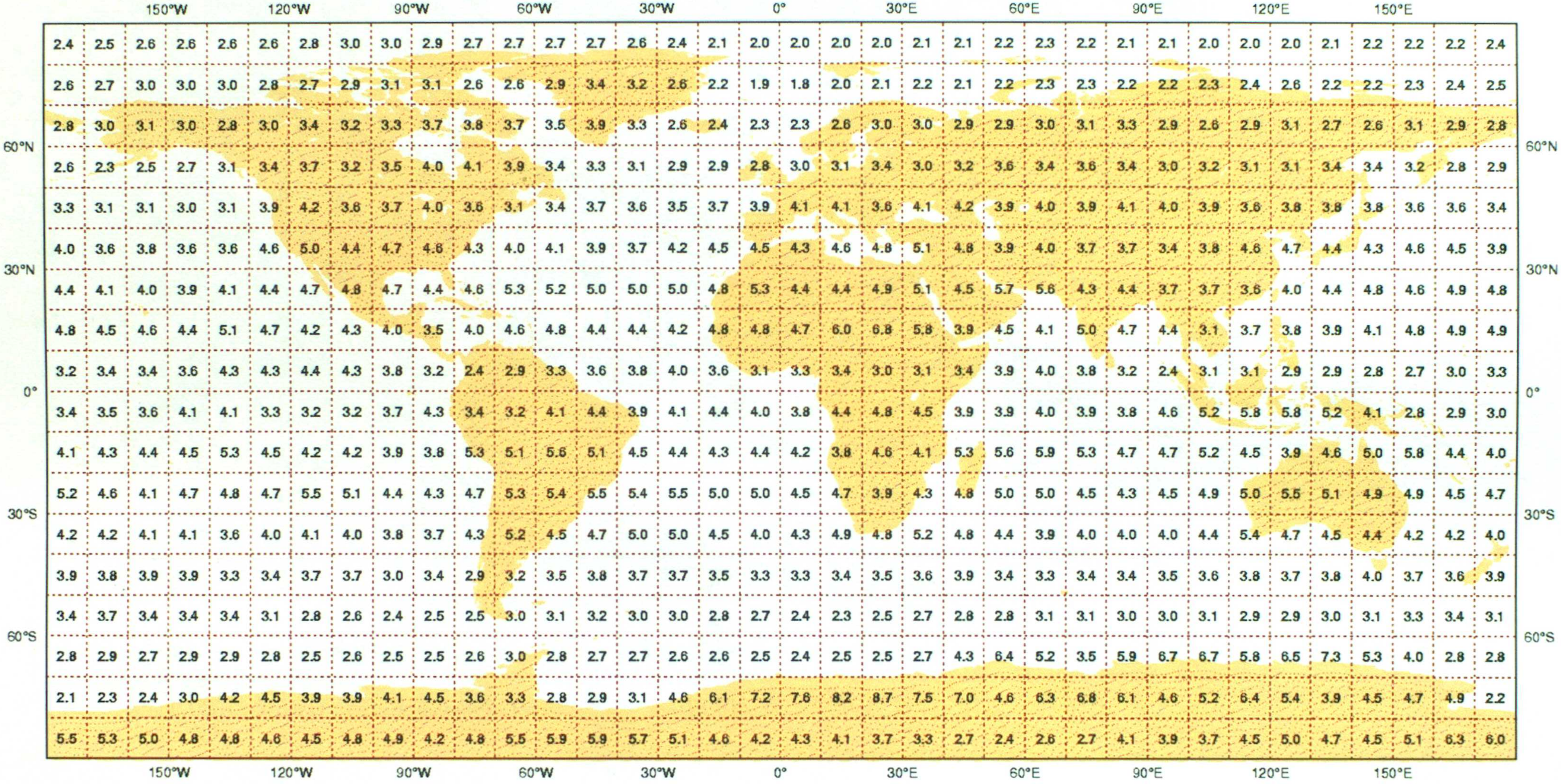
2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.6	2.6
2.8	2.8	2.9	3.0	3.0	3.0	2.9	2.8	2.7	2.6	2.6	2.7	2.9	2.8	2.7	2.5	2.1	1.9	2.0	2.0	2.2	2.5	2.6	2.7	2.9	2.9	2.7	2.4	2.3	2.2	2.2	2.3	2.4	2.6	2.6	2.7
2.7	2.9	3.2	3.3	3.5	3.8	4.0	3.7	3.9	3.8	3.8	3.5	3.3	3.4	3.4	2.9	2.7	2.6	2.6	2.7	3.1	3.4	3.8	4.0	4.1	4.2	4.1	3.8	3.4	3.2	3.0	3.0	3.4	3.6	3.3	2.9
2.7	2.6	2.6	2.7	3.0	3.7	4.0	3.9	4.1	4.4	4.5	3.8	3.1	3.0	3.0	2.9	2.9	3.2	3.8	4.0	3.9	3.9	3.9	3.6	3.6	3.6	3.9	4.1	3.8	3.6	3.5	3.7	3.3	3.3	2.9	2.7
3.1	3.0	3.2	3.1	3.2	3.7	3.7	4.3	4.4	4.0	3.8	3.4	3.3	3.3	3.3	3.3	3.4	3.7	4.0	3.9	3.8	3.8	3.7	3.7	3.8	3.7	4.2	4.3	4.5	4.2	4.0	3.8	3.5	3.3	3.3	3.2
3.6	3.6	3.9	3.6	3.5	3.8	4.4	4.8	4.3	4.0	3.6	3.4	3.5	3.5	3.5	3.5	3.6	4.1	4.0	3.6	3.7	3.8	4.3	3.9	4.1	4.8	4.3	3.9	3.6	3.5	3.8	4.0	4.0	3.8	3.6	3.8
3.4	3.4	3.5	3.4	3.4	3.3	3.4	3.8	3.6	3.7	3.5	3.5	3.6	3.3	3.4	3.5	3.8	4.2	4.0	4.0	4.1	4.1	4.1	4.0	3.8	4.1	4.5	4.0	3.6	3.4	3.4	3.4	3.5	3.4	3.3	3.5
3.4	3.4	3.4	3.3	3.5	3.3	3.4	3.4	3.4	3.5	3.3	3.4	3.5	3.3	3.4	3.4	3.8	4.0	3.8	3.8	4.0	3.7	3.6	3.5	3.5	3.6	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
3.4	3.4	3.3	3.3	3.4	3.3	3.4	3.3	3.3	3.4	3.3	3.4	3.4	3.4	3.3	3.4	3.4	3.4	3.4	3.5	3.6	3.2	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.4	3.4	3.4	3.4	3.3
3.5	3.5	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.3	3.4	3.3	3.4	3.3	3.3	3.4	3.3	3.2	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.4	3.3	3.4	3.4	3.3
3.5	3.5	3.4	3.5	3.5	3.4	3.4	3.4	3.4	3.3	3.6	3.8	3.3	3.4	3.4	3.5	3.5	3.3	3.4	3.4	3.3	3.3	3.4	3.5	3.3	3.3	3.5	3.3	3.5	3.5	3.6	3.6	3.5	3.4	3.5	3.4
3.6	3.6	3.9	4.0	3.8	3.8	3.6	3.5	3.7	3.8	3.8	4.4	3.7	3.7	3.7	3.6	3.6	3.6	3.7	3.7	3.7	3.6	3.4	3.7	3.6	3.7	3.9	3.6	3.7	3.6	3.9	3.7	3.7	3.8	3.7	3.6
3.7	3.6	3.7	3.8	3.6	3.9	3.8	3.8	4.1	4.1	4.1	4.5	4.4	4.3	4.0	3.9	3.9	3.8	4.1	4.0	3.5	3.6	3.6	3.8	3.5	3.6	3.7	3.6	3.5	3.4	3.6	3.6	3.4	3.6	3.7	3.7
3.5	3.5	3.7	3.5	3.5	3.9	3.9	3.8	3.7	3.6	3.8	4.0	4.3	4.3	4.2	4.3	4.3	4.1	4.0	4.0	3.9	4.0	4.1	3.8	3.8	3.6	3.4	3.5	3.5	3.5	3.6	3.6	3.7	3.7	3.6	3.6
3.9	3.9	3.6	3.9	4.1	4.0	3.8	3.7	3.6	3.5	3.4	3.3	3.6	3.8	3.9	3.9	4.0	3.8	3.7	3.7	3.6	3.9	3.9	4.0	4.1	3.8	3.4	3.6	3.7	3.7	3.8	3.5	3.7	4.2	3.8	3.4
4.4	4.3	4.0	4.1	4.1	3.9	3.8	3.7	3.7	3.6	3.7	3.8	3.7	3.9	3.9	3.7	3.8	3.8	3.8	4.0	3.8	3.8	4.6	5.5	5.0	4.3	5.0	5.4	5.4	5.1	5.3	5.4	4.7	4.3	4.3	4.2
3.4	3.6	3.7	3.8	4.1	4.0	3.7	3.6	3.6	3.8	3.6	3.2	3.2	3.5	3.6	3.5	3.6	3.6	3.8	4.2	4.7	4.2	3.7	2.8	3.6	3.8	3.2	2.4	2.6	3.2	2.9	2.2	2.4	2.5	2.8	2.9
4.0	4.2	4.2	4.1	4.0	3.9	3.7	3.4	3.2	3.2	3.5	3.9	4.2	4.3	4.2	3.9	3.4	3.0	2.7	2.5	2.1	1.9	1.7	1.7	1.7	1.8	2.0	1.9	1.9	2.2	2.3	2.3	2.5	3.0	4.0	4.1

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



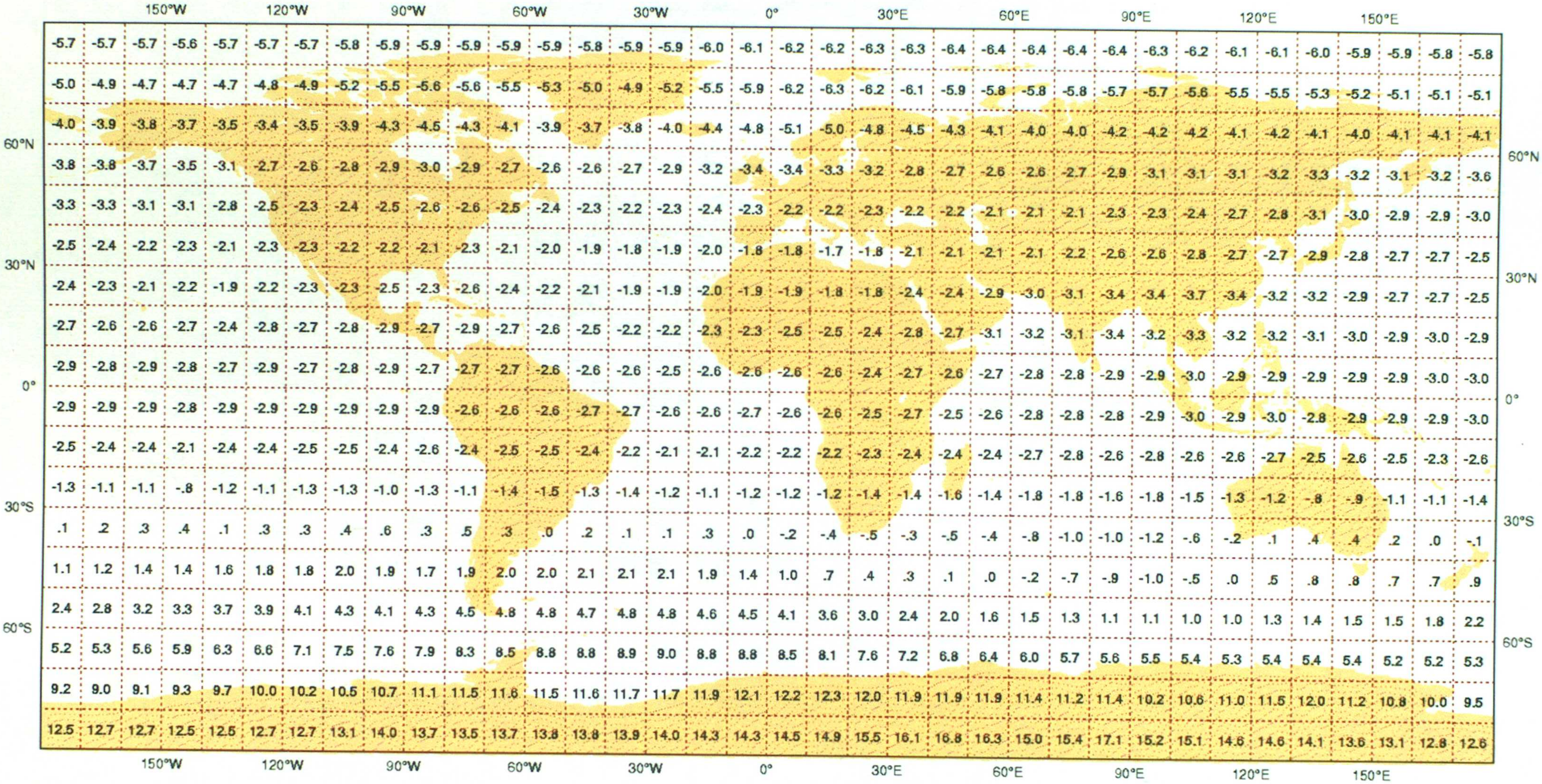
2.6	2.4	2.2	2.3	2.4	2.6	2.5	2.6	2.8	3.1	3.5	3.1	3.1	3.4	3.5	3.0	2.9	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.4	2.7	2.8	2.9	2.9	2.9	3.0	2.9	2.8	2.8	2.8	2.6
1.6	1.0	.7	.4	.6	1.0	1.8	2.4	2.6	3.0	3.3	3.4	4.0	5.9	5.9	3.0	2.2	2.5	2.3	2.0	1.7	1.7	1.9	2.0	2.2	2.2	2.4	2.6	2.6	2.0	1.8	1.8	1.9	1.7	1.9	1.9
1.1	.3	.0	-.2	-.4	-.5	-.3	1.1	2.1	2.0	2.0	1.5	1.3	2.2	1.6	1.0	1.2	1.1	1.2	.9	.0	.2	.4	.5	.4	.3	.4	1.2	1.3	.8	.5	1.0	1.0	.6	1.1	1.2
.6	1.3	1.2	.6	-.2	-.9	-2.0	-1.2	-.5	-.9	-.4	-.7	-1.4	-1.2	-.6	-.5	-.1	-.4	-.8	-.9	-1.3	-.9	-1.5	-2.3	-1.9	-2.0	-.9	.1	.0	.2	.3	.6	.2	.3	.2	-.5
-1.0	-.5	-.4	-.8	-1.1	-1.9	-2.4	-2.5	-2.3	-2.3	-1.9	-1.5	-2.0	-2.2	-2.4	-2.0	-2.3	-3.3	-3.6	-3.5	-2.8	-3.5	-3.3	-4.9	-5.1	-3.3	-3.3	-3.4	-3.3	-2.2	-1.6	-1.0	-1.1	-1.4	-1.5	-1.2
-3.5	-3.6	-3.4	-3.6	-3.7	-5.5	-6.9	-5.6	-5.7	-6.1	-4.9	-4.3	-4.6	-4.7	-3.8	-4.6	-6.7	-6.4	-6.6	-6.7	-6.3	-7.4	-6.5	-6.2	-5.8	-3.1	-3.7	-3.8	-4.3	-5.2	-5.5	-5.2	-3.8	-3.4	-3.5	-3.2
-8.6	-8.3	-8.4	-8.6	-8.9	-9.9	-10.7	-10.5	-9.5	-8.3	-7.3	-6.8	-6.8	-5.4	-5.1	-6.4	-8.4	-10.2	-9.5	-10.8	-11.9	-12.6	-8.7	-11.2	-11.6	-10.2	-8.1	-4.9	-5.1	-3.9	-3.9	-4.3	-5.1	-6.1	-8.2	-9.1
-11.2	-10.4	-10.8	-11.3	-9.3	-9.4	-9.5	-9.3	-7.1	-4.7	-4.6	-5.4	-6.6	-7.8	-7.9	-7.4	-7.1	-8.4	-9.5	-10.2	-9.8	-7.6	-7.1	-12.8	-13.3	-9.7	-8.2	-4.4	-3.8	-4.8	-6.4	-8.0	-8.5	-8.5	-10.2	-10.7
-4.9	-5.1	-5.4	-5.8	-6.4	-6.8	-6.3	-6.5	-5.9	-4.0	-2.4	-3.1	-4.0	-5.4	-5.5	-5.1	-4.9	-6.0	-4.7	-4.0	-3.0	-3.5	-5.3	-5.5	-5.1	-4.6	-3.4	-2.3	-3.6	-3.8	-3.5	-3.1	-2.9	-3.0	-4.0	-4.8
-6.9	-8.0	-8.9	-10.1	-11.8	-13.3	-14.4	-14.1	-13.1	-10.4	-3.9	-3.4	-4.4	-8.0	-8.1	-9.7	-11.5	-11.4	-9.8	-6.3	-6.3	-7.6	-4.7	-5.1	-5.3	-5.0	-4.2	-4.9	-7.0	-8.3	-7.8	-6.5	-4.3	-3.2	-3.9	-5.1
-7.4	-8.5	-8.3	-6.8	-8.8	-13.0	-15.1	-15.1	-15.0	-14.9	-11.7	-9.1	-10.5	-11.8	-10.1	-11.2	-12.6	-12.6	-12.0	-10.4	-10.8	-12.4	-10.7	-7.6	-7.6	-8.5	-8.4	-9.2	-10.2	-11.9	-13.3	-13.2	-12.0	-7.8	-4.5	-6.3
-5.8	-5.5	-6.4	-7.1	-5.4	-5.8	-7.2	-8.0	-8.9	-9.6	-10.2	-10.5	-10.3	-9.3	-8.7	-7.4	-8.2	-9.5	-9.6	-9.4	-9.6	-11.6	-11.5	-10.7	-10.5	-10.5	-10.3	-10.3	-8.8	-7.2	-7.1	-7.7	-8.9	-7.8	-6.0	-5.7
-3.4	-4.0	-3.8	-4.3	-3.9	-3.3	-2.8	-2.8	-3.5	-3.3	-2.9	-4.9	-4.8	-4.1	-5.3	-5.5	-4.7	-4.0	-4.0	-4.9	-5.2	-6.6	-7.7	-6.8	-5.9	-5.3	-4.6	-4.6	-5.0	-6.0	-4.9	-5.0	-6.1	-4.7	-4.3	-4.5
-3.1	-3.1	-2.3	-2.6	-2.1	-1.8	-2.3	-2.0	-.8	-.8	.5	-.6	-1.5	-1.3	-1.5	-1.4	-.6	-.1	.1	-.2	-.9	-1.2	-1.6	-1.5	-1.6	-1.6	-1.4	-1.2	-1.3	-1.6	-1.7	-2.0	-2.2	-2.0	-1.6	-2.2
.0	-.3	-.2	-.2	-.2	.5	1.0	1.4	1.4	1.6	1.7	.8	.9	1.0	1.2	1.5	2.0	2.4	2.5	2.5	2.4	2.0	1.8	1.3	1.3	1.1	.8	1.3	1.1	1.0	1.1	.9	1.0	.8	.8	.6
3.5	3.2	3.0	2.9	2.7	2.7	2.9	2.8	2.7	2.9	2.8	3.5	3.8	3.8	4.0	4.0	4.2	4.7	4.9	4.9	4.9	5.2	6.3	8.0	7.1	5.6	6.6	7.9	7.7	6.9	7.3	8.3	6.9	5.7	4.6	3.9
7.2	6.4	6.1	6.6	7.7	8.1	7.5	7.3	8.3	8.4	8.1	9.4	7.7	7.4	7.7	9.2	13.0	18.3	20.9	21.5	18.7	20.0	24.7	28.2	21.2	21.2	25.9	27.3	28.8	28.0	29.2	29.8	26.5	22.0	12.6	8.2
12.1	11.8	11.2	11.7	12.3	13.2	14.3	16.8	19.0	18.2	15.6	14.5	15.5	16.4	17.7	19.9	22.4	24.8	26.9	28.8	30.9	32.8	32.8	32.5	33.0	33.8	33.3	31.9	33.7	32.2	30.8	27.8	24.5	20.6	15.2	13.1

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



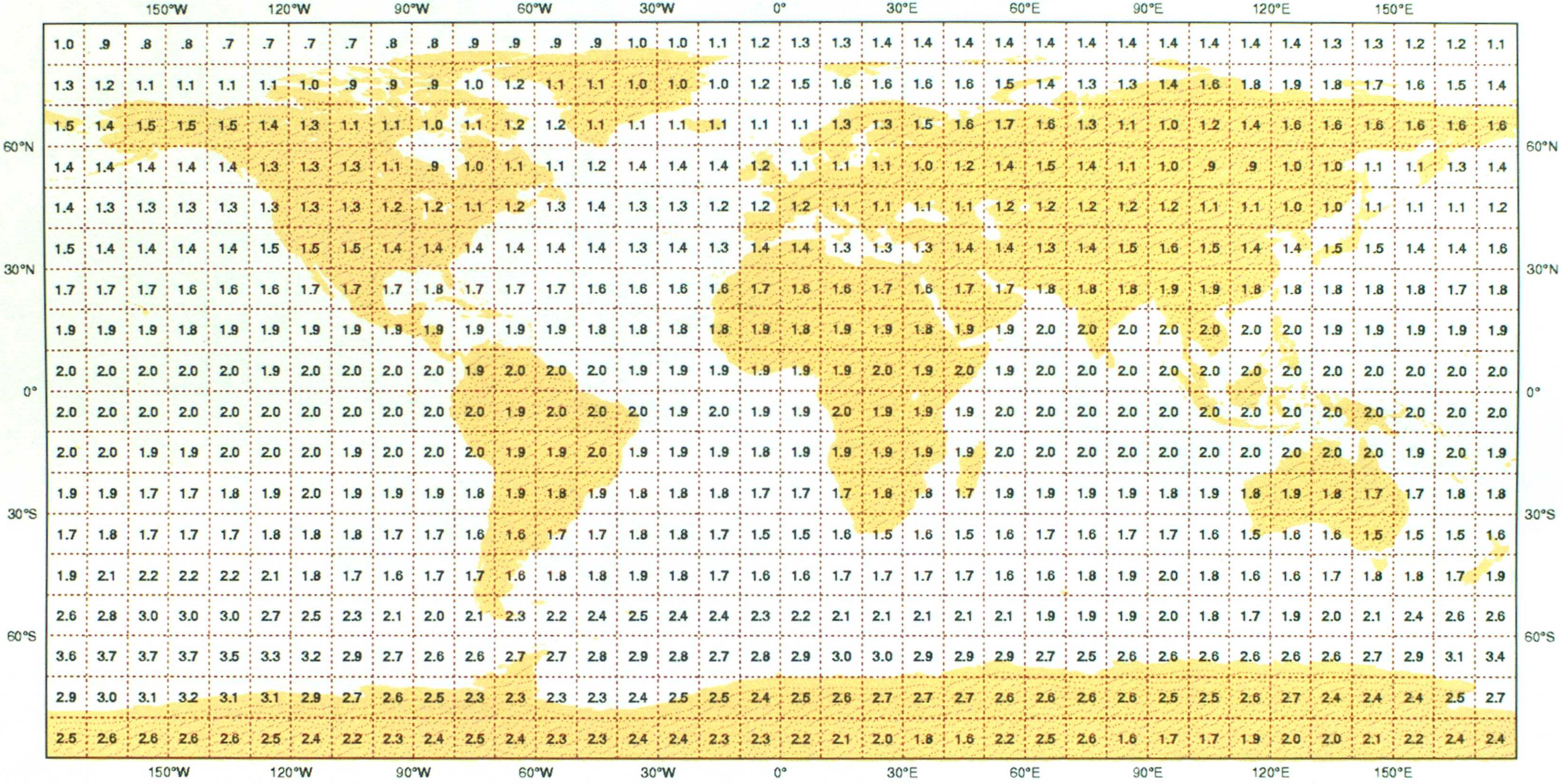
2.4	2.5	2.6	2.6	2.6	2.6	2.8	3.0	3.0	2.9	2.7	2.7	2.7	2.7	2.6	2.4	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.4
2.6	2.7	3.0	3.0	3.0	2.8	2.7	2.9	3.1	3.1	2.6	2.6	2.9	3.4	3.2	2.6	2.2	1.9	1.8	2.0	2.1	2.2	2.1	2.2	2.3	2.3	2.2	2.2	2.3	2.4	2.6	2.2	2.2	2.3	2.4	2.5
2.8	3.0	3.1	3.0	2.8	3.0	3.4	3.2	3.3	3.7	3.8	3.7	3.5	3.9	3.3	2.6	2.4	2.3	2.3	2.6	3.0	3.0	2.9	2.9	3.0	3.1	3.3	2.9	2.6	2.9	3.1	2.7	2.6	3.1	2.9	2.8
2.6	2.3	2.5	2.7	3.1	3.4	3.7	3.2	3.5	4.0	4.1	3.9	3.4	3.3	3.1	2.9	2.9	2.8	3.0	3.1	3.4	3.0	3.2	3.6	3.4	3.6	3.4	3.0	3.2	3.1	3.1	3.4	3.4	3.2	2.8	2.9
3.3	3.1	3.1	3.0	3.1	3.9	4.2	3.6	3.7	4.0	3.6	3.1	3.4	3.7	3.6	3.5	3.7	3.9	4.1	4.1	3.6	4.1	4.2	3.9	4.0	3.9	4.1	4.0	3.9	3.6	3.8	3.8	3.8	3.6	3.6	3.4
4.0	3.6	3.8	3.6	3.6	4.6	5.0	4.4	4.7	4.6	4.3	4.0	4.1	3.9	3.7	4.2	4.5	4.5	4.3	4.6	4.8	5.1	4.8	3.9	4.0	3.7	3.7	3.4	3.8	4.6	4.7	4.4	4.3	4.6	4.5	3.9
4.4	4.1	4.0	3.9	4.1	4.4	4.7	4.8	4.7	4.4	4.6	5.3	5.2	5.0	5.0	5.0	4.8	5.3	4.4	4.4	4.9	5.1	4.5	5.7	5.6	4.3	4.4	3.7	3.7	3.6	4.0	4.4	4.8	4.6	4.9	4.8
4.8	4.5	4.6	4.4	5.1	4.7	4.2	4.3	4.0	3.5	4.0	4.6	4.8	4.4	4.4	4.2	4.8	4.8	4.7	6.0	6.8	5.8	3.9	4.5	4.1	5.0	4.7	4.4	3.1	3.7	3.8	3.9	4.1	4.8	4.9	4.9
3.2	3.4	3.4	3.6	4.3	4.3	4.4	4.3	3.8	3.2	2.4	2.9	3.3	3.6	3.8	4.0	3.6	3.1	3.3	3.4	3.0	3.1	3.4	3.9	4.0	3.8	3.2	2.4	3.1	3.1	2.9	2.9	2.8	2.7	3.0	3.3
3.4	3.5	3.6	4.1	4.1	3.3	3.2	3.2	3.7	4.3	3.4	3.2	4.1	4.4	3.9	4.1	4.4	4.0	3.8	4.4	4.8	4.5	3.9	3.9	4.0	3.9	3.8	4.6	5.2	5.8	5.8	5.2	4.1	2.8	2.9	3.0
4.1	4.3	4.4	4.5	5.3	4.5	4.2	4.2	3.9	3.8	5.3	5.1	5.6	5.1	4.5	4.4	4.3	4.4	4.2	3.8	4.6	4.1	5.3	5.6	5.9	5.3	4.7	4.7	5.2	4.5	3.9	4.6	5.0	5.8	4.4	4.0
5.2	4.6	4.1	4.7	4.8	4.7	5.5	5.1	4.4	4.3	4.7	5.3	5.4	5.5	5.4	5.5	5.0	5.0	4.5	4.7	3.9	4.3	4.8	5.0	5.0	4.5	4.3	4.5	4.9	5.0	5.5	5.1	4.9	4.9	4.5	4.7
4.2	4.2	4.1	4.1	3.6	4.0	4.1	4.0	3.8	3.7	4.3	5.2	4.5	4.7	5.0	5.0	4.5	4.0	4.3	4.9	4.8	5.2	4.8	4.4	3.9	4.0	4.0	4.0	4.4	5.4	4.7	4.5	4.4	4.2	4.2	4.0
3.9	3.8	3.9	3.9	3.3	3.4	3.7	3.7	3.0	3.4	2.9	3.2	3.5	3.8	3.7	3.7	3.5	3.3	3.3	3.4	3.5	3.6	3.9	3.4	3.3	3.4	3.4	3.5	3.6	3.8	3.7	3.8	4.0	3.7	3.6	3.9
3.4	3.7	3.4	3.4	3.4	3.1	2.8	2.6	2.4	2.5	2.5	3.0	3.1	3.2	3.0	3.0	2.8	2.7	2.4	2.3	2.5	2.7	2.8	2.8	3.1	3.1	3.0	3.0	3.1	2.9	2.9	3.0	3.1	3.3	3.4	3.1
2.8	2.9	2.7	2.9	2.9	2.8	2.5	2.6	2.5	2.5	2.6	3.0	2.8	2.7	2.7	2.6	2.6	2.5	2.4	2.5	2.5	2.7	4.3	6.4	5.2	3.5	5.9	6.7	6.7	5.8	6.5	7.3	5.3	4.0	2.8	2.8
2.1	2.3	2.4	3.0	4.2	4.5	3.9	3.9	4.1	4.5	3.6	3.3	2.8	2.9	3.1	4.6	6.1	7.2	7.6	8.2	8.7	7.5	7.0	4.6	6.3	6.8	6.1	4.6	5.2	6.4	5.4	3.9	4.5	4.7	4.9	2.2
5.5	5.3	5.0	4.8	4.8	4.6	4.5	4.8	4.9	4.2	4.8	5.5	5.9	5.9	5.7	5.1	4.6	4.2	4.3	4.1	3.7	3.3	2.7	2.4	2.6	2.7	4.1	3.9	3.7	4.5	5.0	4.7	4.5	5.1	6.3	6.0

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



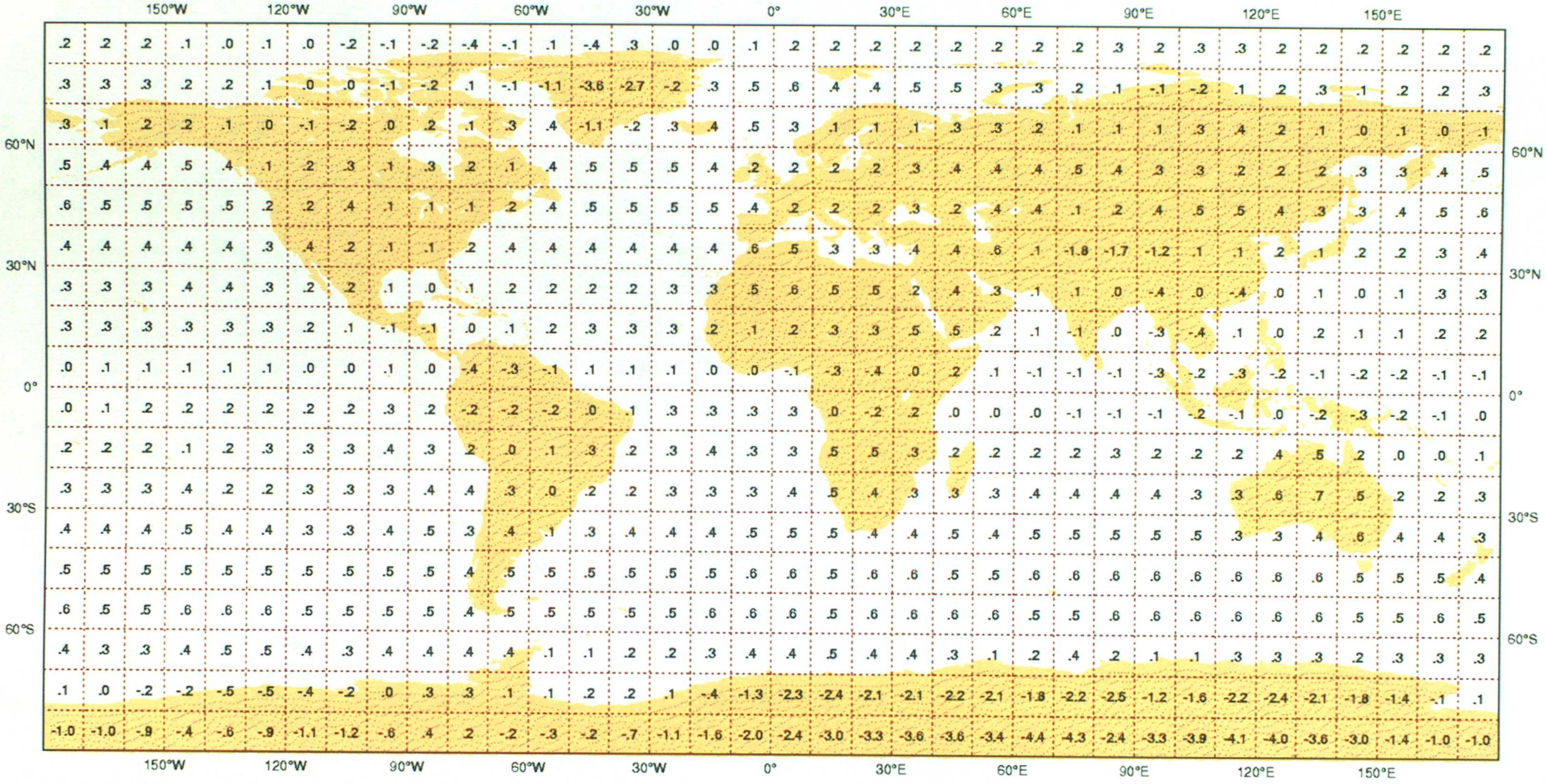
-5.7	-5.7	-5.7	-5.6	-5.7	-5.7	-5.7	-5.8	-5.9	-5.9	-5.9	-5.9	-5.9	-5.8	-5.9	-5.9	-6.0	-6.1	-6.2	-6.2	-6.3	-6.3	-6.4	-6.4	-6.4	-6.4	-6.4	-6.3	-6.2	-6.1	-6.1	-6.0	-5.9	-5.9	-5.8	-5.8
-5.0	-4.9	-4.7	-4.7	-4.7	-4.8	-4.9	-5.2	-5.5	-5.6	-5.6	-5.5	-5.3	-5.0	-4.9	-5.2	-5.5	-5.9	-6.2	-6.3	-6.2	-6.1	-5.9	-5.8	-5.8	-5.8	-5.7	-5.7	-5.6	-5.5	-5.5	-5.3	-5.2	-5.1	-5.1	-5.1
-4.0	-3.9	-3.8	-3.7	-3.5	-3.4	-3.5	-3.9	-4.3	-4.5	-4.3	-4.1	-3.9	-3.7	-3.8	-4.0	-4.4	-4.8	-5.1	-5.0	-4.8	-4.5	-4.3	-4.1	-4.0	-4.0	-4.2	-4.2	-4.2	-4.1	-4.2	-4.1	-4.0	-4.1	-4.1	-4.1
-3.8	-3.8	-3.7	-3.5	-3.1	-2.7	-2.6	-2.8	-2.9	-3.0	-2.9	-2.7	-2.6	-2.6	-2.7	-2.9	-3.2	-3.4	-3.4	-3.3	-3.2	-2.8	-2.7	-2.6	-2.6	-2.7	-2.9	-3.1	-3.1	-3.1	-3.2	-3.3	-3.2	-3.1	-3.2	-3.6
-3.3	-3.3	-3.1	-3.1	-2.8	-2.5	-2.3	-2.4	-2.5	-2.6	-2.6	-2.5	-2.4	-2.3	-2.2	-2.3	-2.4	-2.3	-2.2	-2.2	-2.3	-2.2	-2.2	-2.1	-2.1	-2.1	-2.3	-2.3	-2.4	-2.7	-2.8	-3.1	-3.0	-2.9	-2.9	-3.0
-2.5	-2.4	-2.2	-2.3	-2.1	-2.3	-2.3	-2.2	-2.2	-2.1	-2.3	-2.1	-2.0	-1.9	-1.8	-1.9	-2.0	-1.8	-1.8	-1.7	-1.8	-2.1	-2.1	-2.1	-2.1	-2.2	-2.6	-2.6	-2.8	-2.7	-2.7	-2.9	-2.8	-2.7	-2.7	-2.5
-2.4	-2.3	-2.1	-2.2	-1.9	-2.2	-2.3	-2.3	-2.5	-2.3	-2.6	-2.4	-2.2	-2.1	-1.9	-1.9	-2.0	-1.9	-1.9	-1.8	-1.8	-2.4	-2.4	-2.9	-3.0	-3.1	-3.4	-3.4	-3.7	-3.4	-3.2	-3.2	-2.9	-2.7	-2.7	-2.5
-2.7	-2.6	-2.6	-2.7	-2.4	-2.8	-2.7	-2.8	-2.9	-2.7	-2.9	-2.7	-2.6	-2.5	-2.2	-2.2	-2.3	-2.3	-2.5	-2.5	-2.4	-2.8	-2.7	-3.1	-3.2	-3.1	-3.4	-3.2	-3.3	-3.2	-3.2	-3.1	-3.0	-2.9	-3.0	-2.9
-2.9	-2.8	-2.9	-2.8	-2.7	-2.9	-2.7	-2.8	-2.9	-2.7	-2.7	-2.7	-2.6	-2.6	-2.6	-2.5	-2.6	-2.6	-2.6	-2.6	-2.4	-2.7	-2.6	-2.7	-2.8	-2.8	-2.9	-2.9	-3.0	-2.9	-2.9	-2.9	-2.9	-2.9	-3.0	-3.0
-2.9	-2.9	-2.9	-2.8	-2.9	-2.9	-2.9	-2.9	-2.9	-2.9	-2.6	-2.6	-2.6	-2.7	-2.7	-2.6	-2.6	-2.7	-2.6	-2.6	-2.5	-2.7	-2.5	-2.6	-2.8	-2.8	-2.8	-2.9	-3.0	-2.9	-3.0	-2.8	-2.9	-2.9	-2.9	-3.0
-2.5	-2.4	-2.4	-2.1	-2.4	-2.4	-2.5	-2.5	-2.4	-2.6	-2.4	-2.5	-2.5	-2.4	-2.2	-2.1	-2.1	-2.2	-2.2	-2.2	-2.3	-2.4	-2.4	-2.4	-2.7	-2.8	-2.6	-2.8	-2.6	-2.6	-2.7	-2.5	-2.6	-2.5	-2.3	-2.6
-1.3	-1.1	-1.1	-.8	-1.2	-1.1	-1.3	-1.3	-1.0	-1.3	-1.1	-1.4	-1.5	-1.3	-1.4	-1.2	-1.1	-1.2	-1.2	-1.2	-1.4	-1.4	-1.6	-1.4	-1.8	-1.8	-1.6	-1.8	-1.5	-1.3	-1.2	-.8	-.9	-1.1	-1.1	-1.4
.1	.2	.3	.4	.1	.3	.3	.4	.6	.3	.5	.3	.0	.2	.1	.1	.3	.0	-.2	-.4	-.5	-.3	-.5	-.4	-.8	-1.0	-1.0	-1.2	-.6	-.2	.1	.4	.4	.2	.0	-.1
1.1	1.2	1.4	1.4	1.6	1.8	1.8	2.0	1.9	1.7	1.9	2.0	2.0	2.1	2.1	2.1	1.9	1.4	1.0	.7	.4	.3	.1	.0	-.2	-.7	-.9	-1.0	-.5	.0	.5	.8	.8	.7	.7	.9
2.4	2.8	3.2	3.3	3.7	3.9	4.1	4.3	4.1	4.3	4.5	4.8	4.8	4.7	4.8	4.8	4.6	4.5	4.1	3.6	3.0	2.4	2.0	1.6	1.5	1.3	1.1	1.1	1.0	1.0	1.3	1.4	1.5	1.5	1.8	2.2
5.2	5.3	5.6	5.9	6.3	6.6	7.1	7.5	7.6	7.9	8.3	8.5	8.8	8.8	8.9	9.0	8.8	8.8	8.5	8.1	7.6	7.2	6.8	6.4	6.0	5.7	5.6	5.5	5.4	5.3	5.4	5.4	5.4	5.2	5.2	5.3
9.2	9.0	9.1	9.3	9.7	10.0	10.2	10.5	10.7	11.1	11.5	11.6	11.5	11.6	11.7	11.7	11.9	12.1	12.2	12.3	12.0	11.9	11.9	11.9	11.4	11.2	11.4	10.2	10.6	11.0	11.5	12.0	11.2	10.8	10.0	9.5
12.5	12.7	12.7	12.5	12.5	12.7	12.7	13.1	14.0	13.7	13.5	13.7	13.8	13.8	13.9	14.0	14.3	14.3	14.5	14.9	15.5	16.1	16.8	16.3	15.0	15.4	17.1	15.2	15.1	14.6	14.6	14.1	13.6	13.1	12.8	12.6

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



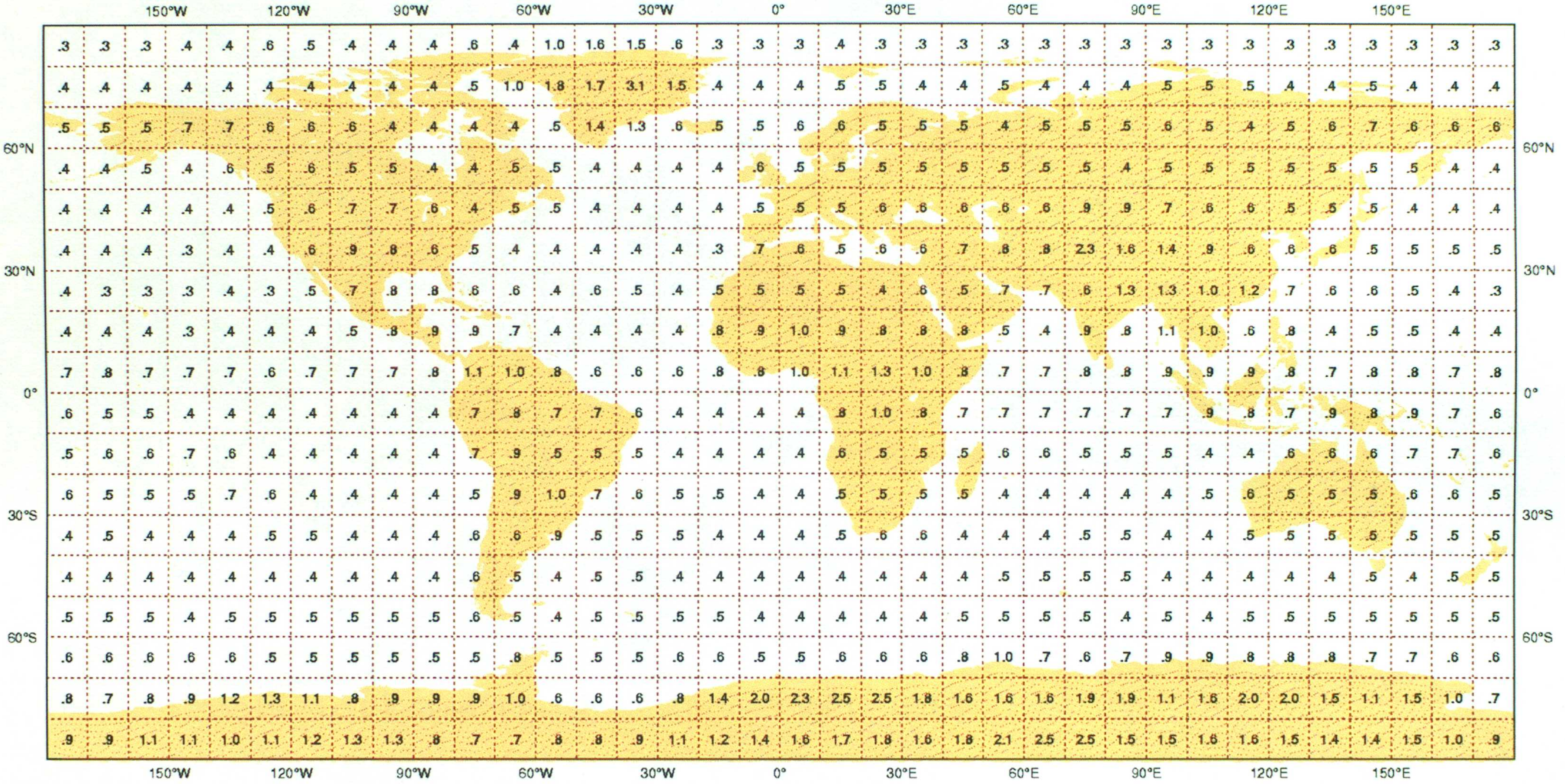
1.0	.9	.8	.8	.7	.7	.7	.7	.8	.8	.9	.9	.9	.9	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.1
1.3	1.2	1.1	1.1	1.1	1.1	1.0	.9	.9	.9	1.0	1.2	1.1	1.1	1.0	1.0	1.0	1.2	1.5	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.4	1.6	1.8	1.9	1.8	1.7	1.6	1.5	1.4
1.5	1.4	1.5	1.5	1.5	1.4	1.3	1.1	1.1	1.0	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.3	1.5	1.6	1.7	1.6	1.3	1.1	1.0	1.2	1.4	1.6	1.6	1.6	1.6	1.6	1.6
1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.1	.9	1.0	1.1	1.1	1.2	1.4	1.4	1.4	1.2	1.1	1.1	1.1	1.0	1.2	1.4	1.5	1.4	1.1	1.0	.9	.9	1.0	1.0	1.1	1.1	1.3	1.4
1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.2	1.3	1.4	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.2
1.5	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.4	1.3	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.3	1.4	1.5	1.6	1.5	1.4	1.4	1.5	1.5	1.4	1.4	1.6
1.7	1.7	1.7	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.7	1.6	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.7	1.8
1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9
2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	2.0	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2.0	2.0	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9
1.9	1.9	1.7	1.7	1.8	1.9	2.0	1.9	1.9	1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.7	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.9	1.8	1.7	1.7	1.8	1.8
1.7	1.8	1.7	1.7	1.7	1.8	1.8	1.8	1.7	1.7	1.6	1.6	1.7	1.7	1.8	1.8	1.7	1.5	1.5	1.6	1.5	1.6	1.5	1.6	1.7	1.6	1.7	1.7	1.6	1.5	1.6	1.6	1.5	1.5	1.5	1.6
1.9	2.1	2.2	2.2	2.2	2.1	1.8	1.7	1.6	1.7	1.7	1.6	1.8	1.8	1.9	1.8	1.7	1.6	1.6	1.7	1.7	1.7	1.7	1.6	1.6	1.8	1.9	2.0	1.8	1.6	1.6	1.7	1.8	1.8	1.7	1.9
2.6	2.8	3.0	3.0	3.0	2.7	2.5	2.3	2.1	2.0	2.1	2.3	2.2	2.4	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	1.9	1.9	1.9	2.0	1.8	1.7	1.9	2.0	2.1	2.4	2.6	2.6
3.6	3.7	3.7	3.7	3.5	3.3	3.2	2.9	2.7	2.6	2.6	2.7	2.7	2.8	2.9	2.8	2.7	2.8	2.9	3.0	3.0	2.9	2.9	2.9	2.7	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.9	3.1	3.4
2.9	3.0	3.1	3.2	3.1	3.1	2.9	2.7	2.6	2.5	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.5	2.6	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.6	2.7	2.4	2.4	2.4	2.5	2.7
2.5	2.6	2.6	2.6	2.6	2.5	2.4	2.2	2.3	2.4	2.5	2.4	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.1	2.0	1.8	1.6	2.2	2.5	2.6	1.6	1.7	1.7	1.9	2.0	2.0	2.1	2.2	2.4	2.4

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



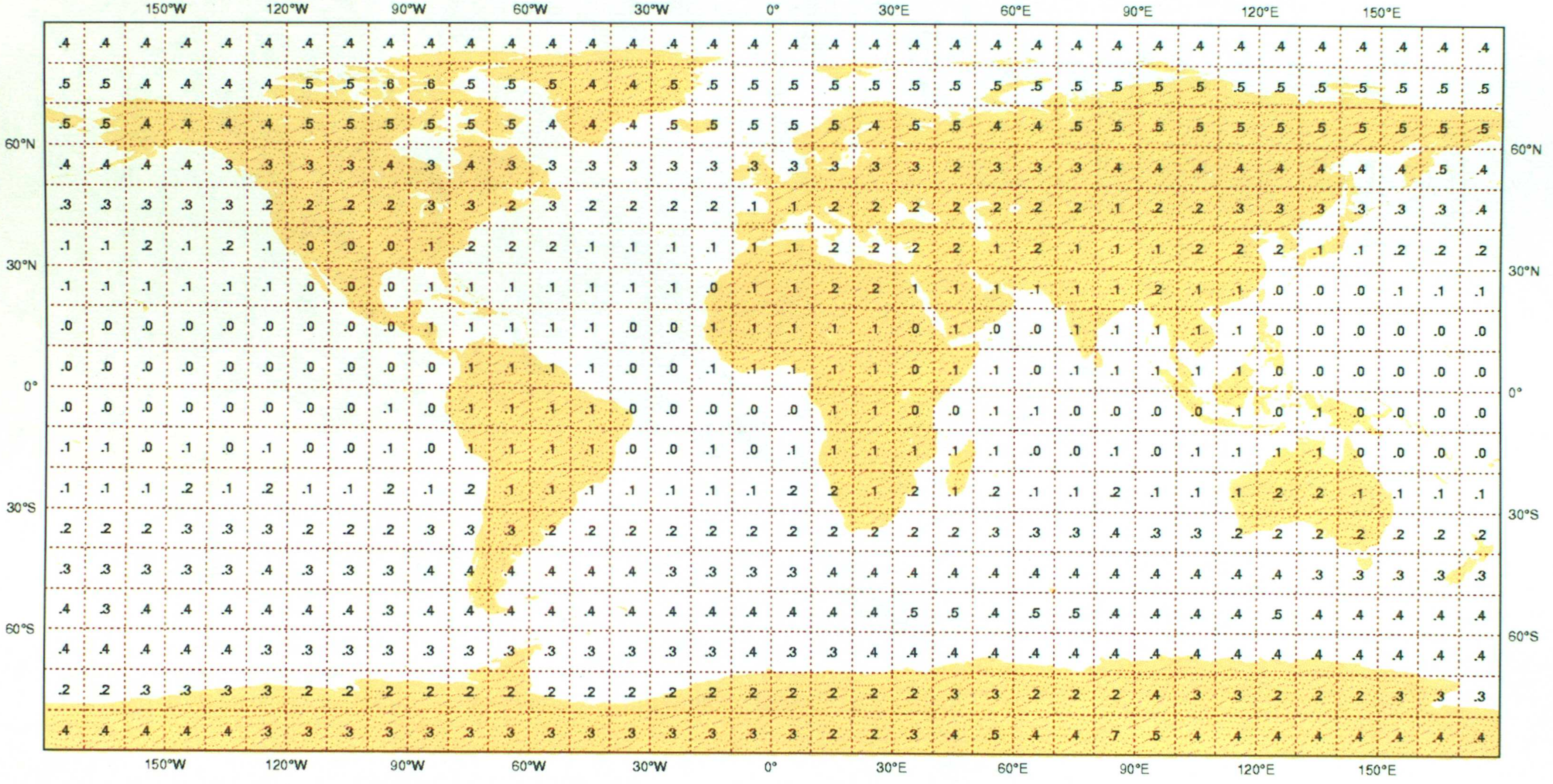
.2	.2	.2	.1	.0	.1	.0	-.2	-.1	-.2	-.4	-.1	.1	-.4	.3	.0	.0	.1	.2	.2	.2	.2	.2	.2	.2	.2	.3	.2	.3	.3	.2	.2	.2	.2	.2	.2
.3	.3	.3	.2	.2	.1	.0	.0	-.1	-.2	.1	-.1	-1.1	-3.6	-2.7	-.2	.3	.5	.6	.4	.4	.5	.5	.3	.3	.2	.1	-.1	-.2	.1	.2	.3	.1	.2	.2	.3
.3	.1	.2	.2	.1	.0	-.1	-.2	.0	.2	.1	.3	.4	-1.1	-.2	.3	.4	.5	.3	.1	.1	.1	.3	.3	.2	.1	.1	.1	.3	.4	.2	.1	.0	.1	.0	.1
.5	.4	.4	.5	.4	.1	.2	.3	.1	.3	.2	.1	.4	.5	.5	.5	.4	.2	.2	.2	.2	.3	.4	.4	.4	.5	.4	.3	.3	.2	.2	.2	.3	.3	.4	.5
.6	.5	.5	.5	.5	.2	.2	.4	.1	.1	.1	.2	.4	.5	.5	.5	.5	.4	.2	.2	.2	.3	.2	.4	.4	.1	.2	.4	.5	.5	.4	.3	.3	.4	.5	.6
.4	.4	.4	.4	.4	.3	.4	.2	.1	.1	.2	.4	.4	.4	.4	.4	.4	.6	.5	.3	.3	.4	.4	.6	.1	-1.8	-1.7	-1.2	.1	.1	.2	.1	.2	.2	.3	.4
.3	.3	.3	.4	.4	.3	.2	.2	.1	.0	.1	.2	.2	.2	.2	.3	.3	.5	.6	.5	.5	.2	.4	.3	.1	.1	.0	-.4	.0	-.4	.0	.1	.0	.1	.3	.3
.3	.3	.3	.3	.3	.3	.2	.1	-.1	-.1	.0	.1	.2	.3	.3	.3	.2	.1	.2	.3	.3	.5	.5	.2	.1	-.1	.0	-.3	-.4	.1	.0	.2	.1	.1	.2	.2
.0	.1	.1	.1	.1	.1	.0	.0	.1	.0	-.4	-.3	-.1	.1	.1	.1	.0	.0	-.1	-.3	-.4	.0	.2	.1	-.1	-.1	-.1	-.3	-.2	-.3	-.2	-.1	-.2	-.2	-.1	-.1
.0	.1	.2	.2	.2	.2	.2	.2	.3	.2	-.2	-.2	-.2	.0	.1	.3	.3	.3	.3	.0	-.2	.2	.0	.0	.0	-.1	-.1	-.1	-.2	-.1	.0	-.2	-.3	-.2	-.1	.0
.2	.2	.2	.1	.2	.3	.3	.3	.4	.3	.2	.0	.1	.3	.2	.3	.4	.3	.3	.5	.5	.3	.2	.2	.2	.2	.3	.2	.2	.2	.4	.5	.2	.0	.0	.1
.3	.3	.3	.4	.2	.2	.3	.3	.3	.4	.4	.3	.0	.2	.2	.3	.3	.3	.4	.5	.4	.3	.3	.3	.4	.4	.4	.4	.3	.3	.6	.7	.5	.2	.2	.3
.4	.4	.4	.5	.4	.4	.3	.3	.4	.5	.3	.4	.1	.3	.4	.4	.4	.5	.5	.5	.4	.4	.5	.4	.5	.5	.5	.5	.5	.3	.3	.4	.6	.4	.4	.3
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.6	.6	.5	.6	.6	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.4
.6	.5	.5	.6	.6	.6	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.6	.6	.6	.5	.6	.6	.6	.6	.5	.5	.6	.6	.6	.6	.6	.6	.5	.5	.6	.5
.4	.3	.3	.4	.5	.5	.4	.3	.4	.4	.4	.4	.1	.1	.2	.2	.3	.4	.4	.5	.4	.4	.3	.1	.2	.4	.2	.1	.1	.3	.3	.3	.2	.3	.3	.3
.1	.0	-.2	-.2	-.5	-.5	-.4	-.2	.0	.3	.3	.1	.1	.2	.2	.1	-.4	-1.3	-2.3	-2.4	-2.1	-2.1	-2.2	-2.1	-1.8	-2.2	-2.5	-1.2	-1.6	-2.2	-2.4	-2.1	-1.8	-1.4	-.1	.1
-1.0	-1.0	-.9	-.4	-.6	-.9	-1.1	-1.2	-.6	.4	.2	-.2	-.3	-.2	-.7	-1.1	-1.6	-2.0	-2.4	-3.0	-3.3	-3.6	-3.6	-3.4	-4.4	-4.3	-2.4	-3.3	-3.9	-4.1	-4.0	-3.6	-3.0	-1.4	-1.0	-1.0

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.3	.3	.3	.4	.4	.6	.5	.4	.4	.4	.6	.4	1.0	1.6	1.5	.6	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	1.0	1.8	1.7	3.1	1.5	.4	.4	.4	.5	.5	.4	.4	.5	.4	.4	.4	.5	.5	.5	.4	.4	.5	.4	.4	.4
.5	.5	.5	.7	.7	.6	.6	.6	.4	.4	.4	.4	.5	1.4	1.3	.6	.5	.5	.6	.6	.5	.5	.5	.4	.5	.5	.5	.6	.5	.4	.5	.6	.7	.6	.6	.6
.4	.4	.5	.4	.6	.5	.6	.5	.5	.4	.4	.5	.5	.4	.4	.4	.4	.6	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.4
.4	.4	.4	.4	.4	.5	.6	.7	.7	.6	.4	.5	.5	.4	.4	.4	.4	.5	.5	.5	.6	.6	.6	.6	.6	.9	.9	.7	.6	.6	.5	.5	.5	.4	.4	.4
.4	.4	.4	.3	.4	.4	.6	.9	.8	.6	.5	.4	.4	.4	.4	.4	.3	.7	.6	.5	.6	.6	.7	.8	.8	2.3	1.6	1.4	.9	.6	.6	.6	.5	.5	.5	.5
.4	.3	.3	.3	.4	.3	.5	.7	.8	.8	.6	.6	.4	.6	.5	.4	.5	.5	.5	.5	.4	.6	.5	.7	.7	.6	1.3	1.3	1.0	1.2	.7	.6	.6	.5	.4	.3
.4	.4	.4	.3	.4	.4	.4	.5	.8	.9	.9	.7	.4	.4	.4	.4	.8	.9	1.0	.9	.8	.8	.8	.5	.4	.9	.8	1.1	1.0	.6	.8	.4	.5	.5	.4	.4
.7	.8	.7	.7	.7	.6	.7	.7	.7	.8	1.1	1.0	.8	.6	.6	.6	.8	.8	1.0	1.1	1.3	1.0	.8	.7	.7	.8	.8	.9	.9	.9	.8	.7	.8	.8	.7	.8
.6	.5	.5	.4	.4	.4	.4	.4	.4	.4	.7	.8	.7	.7	.6	.4	.4	.4	.4	.8	1.0	.8	.7	.7	.7	.7	.7	.7	.9	.8	.7	.9	.8	.9	.7	.6
.5	.6	.6	.7	.6	.4	.4	.4	.4	.4	.7	.9	.5	.5	.5	.4	.4	.4	.4	.6	.5	.5	.5	.6	.6	.5	.5	.5	.4	.4	.6	.6	.6	.7	.7	.6
.6	.5	.5	.5	.7	.6	.4	.4	.4	.4	.5	.9	1.0	.7	.6	.5	.5	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.6	.5	.5	.5	.6	.6	.5
.4	.5	.4	.4	.4	.5	.5	.4	.4	.4	.6	.6	.9	.5	.5	.5	.4	.4	.4	.5	.6	.6	.4	.4	.4	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.6	.5	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.4	.5	.5
.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.6	.5	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.5	.5	.5	.4	.5	.4	.5	.5	.5	.5	.5	.5	.5
.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.8	.5	.5	.5	.6	.6	.5	.5	.6	.6	.6	.8	1.0	.7	.6	.7	.9	.9	.8	.8	.8	.7	.7	.6	.6
.8	.7	.8	.9	1.2	1.3	1.1	.8	.9	.9	.9	1.0	.6	.6	.6	.8	1.4	2.0	2.3	2.5	2.5	1.8	1.6	1.6	1.6	1.9	1.9	1.1	1.6	2.0	2.0	1.5	1.1	1.5	1.0	.7
.9	.9	1.1	1.1	1.0	1.1	1.2	1.3	1.3	.8	.7	.7	.8	.8	.9	1.1	1.2	1.4	1.6	1.7	1.8	1.6	1.8	2.1	2.5	2.5	1.5	1.5	1.6	1.6	1.5	1.4	1.4	1.5	1.0	.9

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.5	.5	.4	.4	.4	.4	.5	.5	.6	.6	.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.4	.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
.4	.4	.4	.4	.3	.3	.3	.3	.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4
.3	.3	.3	.3	.3	.2	.2	.2	.2	.3	.3	.2	.3	.2	.2	.2	.2	.1	.1	.2	.2	.2	.2	.2	.2	.2	.1	.2	.2	.3	.3	.3	.3	.3	.3	.4
.1	.1	.2	.1	.2	.1	.0	.0	.0	.1	.2	.2	.2	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	.1	.2	.1	.1	.1	.2	.2	.2	.1	.1	.2	.2	.2
.1	.1	.1	.1	.1	.1	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.0	.1	.1	.2	.2	.1	.1	.1	.1	.1	.1	.2	.1	.1	.0	.0	.0	.1	.1	.1
.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.0	.0	.1	.1	.1	.1	.1	.0	.1	.0	.0	.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0
.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.0	.0	.1	.1	.1	.1	.1	.0	.1	.1	.0	.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0
.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.1	.1	.1	.1	.0	.0	.0	.0	.0	.1	.1	.0	.0	.1	.1	.0	.0	.0	.0	.1	.0	.1	.0	.0	.0	.0
.1	.1	.0	.1	.0	.1	.0	.0	.1	.0	.1	.1	.1	.1	.0	.0	.1	.0	.1	.1	.1	.1	.1	.1	.0	.0	.1	.0	.1	.1	.1	.1	.0	.0	.0	.0
.1	.1	.1	.2	.1	.2	.1	.1	.2	.1	.2	.1	.1	.1	.1	.1	.1	.1	.2	.2	.1	.2	.1	.2	.1	.1	.2	.1	.1	.1	.2	.2	.1	.1	.1	.1
.2	.2	.2	.3	.3	.3	.2	.2	.2	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.3	.4	.3	.3	.2	.2	.2	.2	.2	.2	.2
.3	.3	.3	.3	.3	.4	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3
.4	.3	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.5	.5	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.2	.2	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.2	.2	.2	.4	.3	.3	.2	.2	.2	.3	.3	.3
.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.3	.4	.5	.4	.4	.7	.5	.4	.4	.4	.4	.4	.4	.4	.4

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

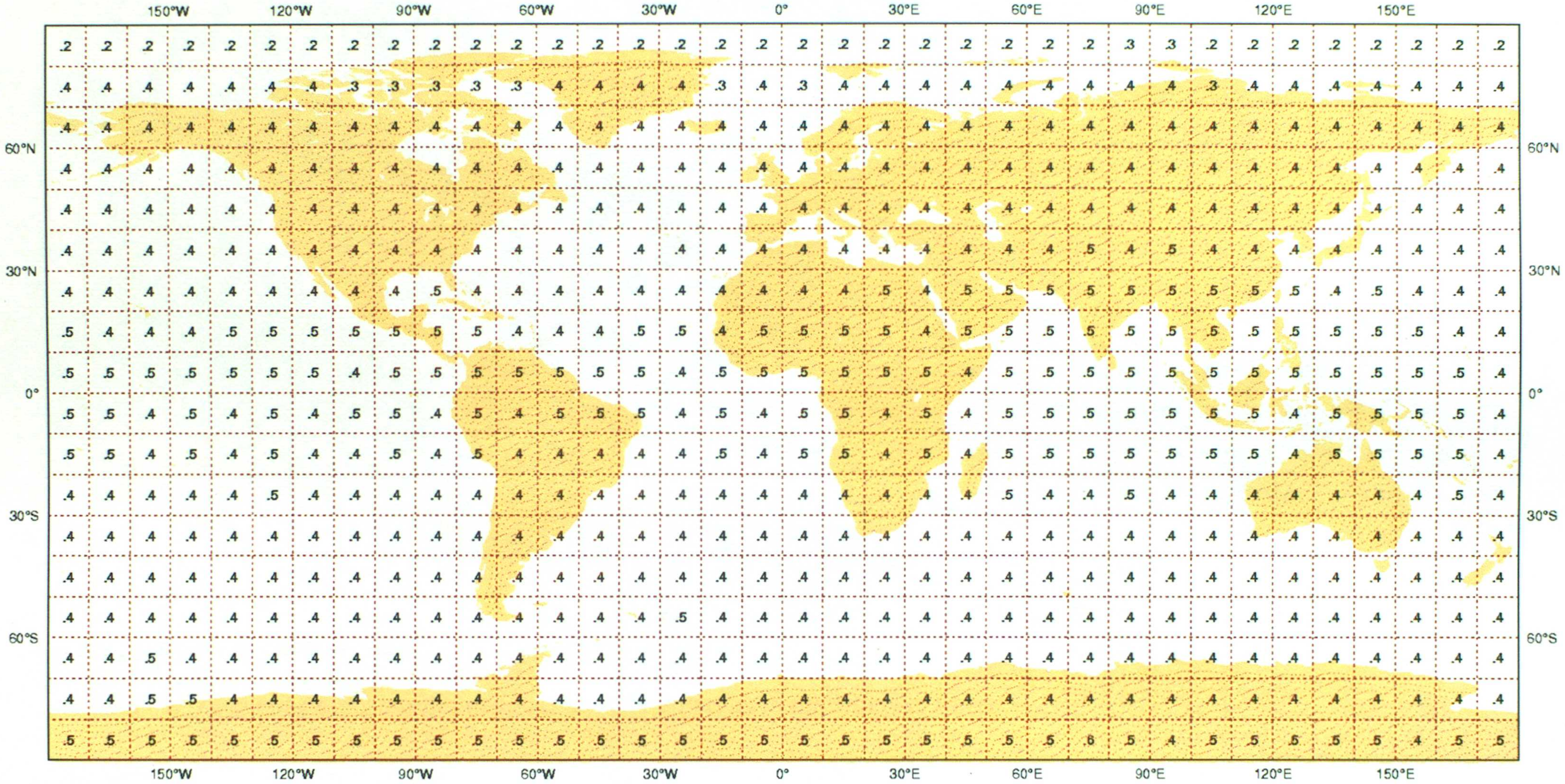
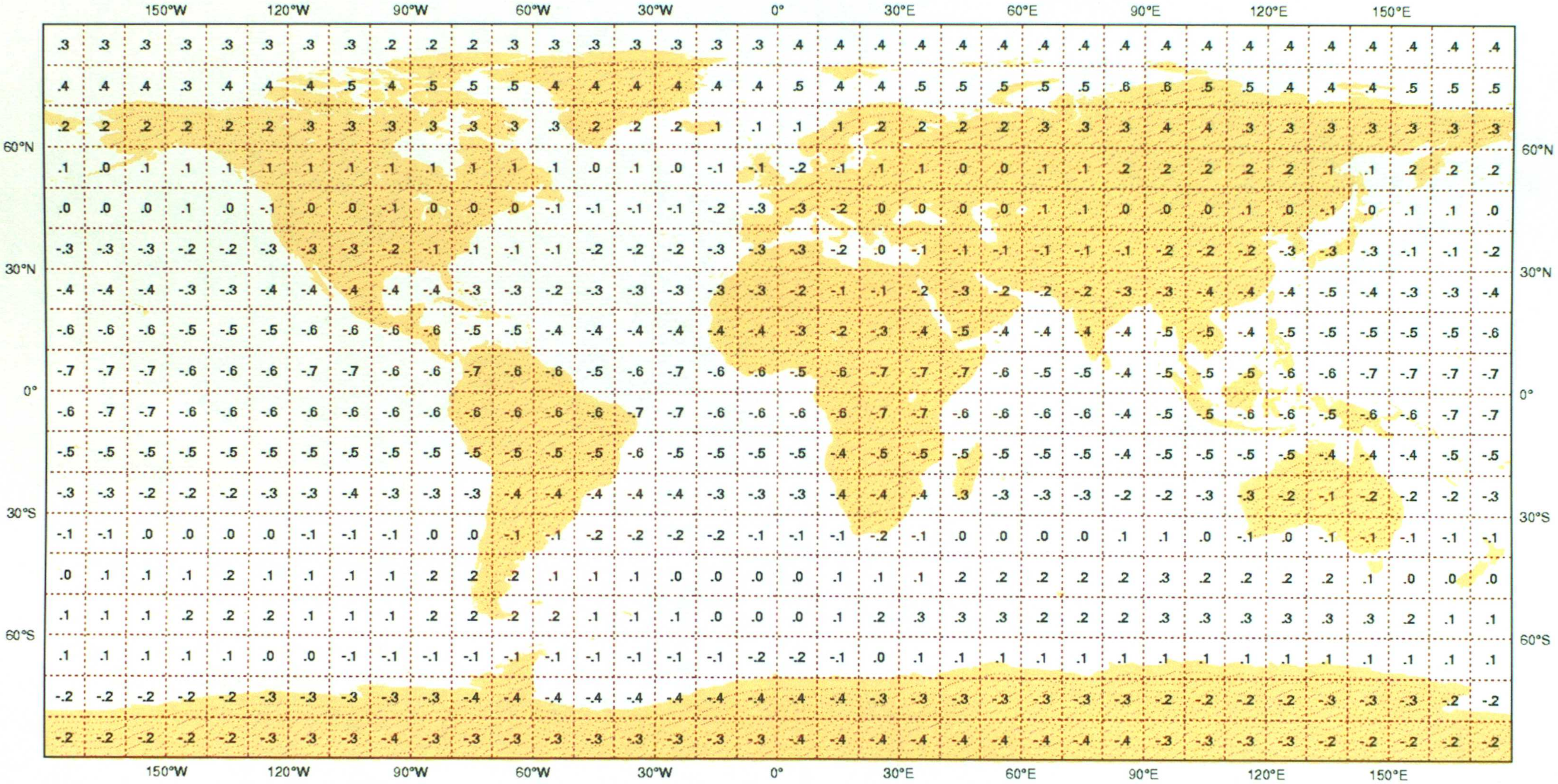

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2
.4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .4
.5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .5 .4 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4
.5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4
.5 .5 .4 .5 .4 .5 .4 .5 .5 .4 .5 .4 .5 .5 .5 .4 .5 .4 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4
.5 .5 .4 .5 .4 .5 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .5 .4 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4
.4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .4 .5 .5 .5 .5 .5 .4 .5 .5

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.3	.4	.4	.4	.5	.4	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.5	.5	.5	.5	.6	.6	.5	.5	.4	.4	.4	.5	.5	.5
.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.1	.1	.1	.1	.2	.2	.2	.2	.3	.3	.3	.4	.4	.3	.3	.3	.3	.3	.3	.3
.1	.0	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	.1	.0	-.1	-.1	-.2	-.1	.1	.1	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1	.1	.2	.2	.2
.0	.0	.0	.1	.0	-.1	.0	.0	-.1	.0	.0	.0	-.1	-.1	-.1	-.1	-.2	-.3	-.3	-.2	.0	.0	.0	.0	.1	.1	.0	.0	.0	.1	.0	-.1	.0	.1	.1	.0
-.3	-.3	-.3	-.2	-.2	-.3	-.3	-.3	-.2	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.2	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.1	-.1	-.2
-.4	-.4	-.4	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.2	-.3	-.3	-.3	-.3	-.3	-.2	-.1	-.1	-.2	-.3	-.2	-.2	-.2	-.3	-.3	-.4	-.4	-.4	-.5	-.4	-.3	-.3	-.4
-.6	-.6	-.6	-.5	-.5	-.5	-.6	-.6	-.6	-.6	-.5	-.5	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.2	-.3	-.4	-.5	-.4	-.4	-.4	-.4	-.5	-.5	-.4	-.5	-.5	-.5	-.5	-.5	-.6
-.7	-.7	-.7	-.6	-.6	-.6	-.7	-.7	-.6	-.6	-.7	-.6	-.6	-.5	-.6	-.7	-.6	-.6	-.5	-.6	-.7	-.7	-.7	-.6	-.5	-.5	-.4	-.5	-.5	-.5	-.6	-.6	-.7	-.7	-.7	-.7
-.6	-.7	-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.6	-.6	-.6	-.6	-.7	-.7	-.6	-.6	-.6	-.6	-.4	-.5	-.5	-.6	-.6	-.5	-.6	-.6	-.7	-.7
-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6	-.5	-.5	-.5	-.5	-.4	-.5	-.5	-.5	-.5	-.5	-.5	-.4	-.5	-.5	-.5	-.5	-.4	-.4	-.4	-.5	-.5
-.3	-.3	-.2	-.2	-.2	-.3	-.3	-.4	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.2	-.2	-.3	-.3	-.2	-.1	-.2	-.2	-.2	-.3
-.1	-.1	.0	.0	.0	.0	-.1	-.1	-.1	.0	.0	-.1	-.1	-.2	-.2	-.2	-.2	-.1	-.1	-.1	-.2	-.1	.0	.0	.0	.0	.1	.1	.0	-.1	.0	-.1	-.1	-.1	-.1	-.1
.0	.1	.1	.1	.2	.1	.1	.1	.1	.2	.2	.2	.1	.1	.1	.0	.0	.0	.0	.1	.1	.1	.2	.2	.2	.2	.2	.3	.2	.2	.2	.2	.1	.0	.0	.0
.1	.1	.1	.2	.2	.2	.1	.1	.1	.2	.2	.2	.2	.1	.1	.1	.0	.0	.0	.1	.2	.3	.3	.3	.2	.2	.2	.3	.3	.3	.3	.3	.3	.2	.1	.1
.1	.1	.1	.1	.1	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.1	.0	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
-.2	-.2	-.2	-.2	-.2	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.2	-.2	-.2	-.3	-.3	-.3	-.2	-.2
-.2	-.2	-.2	-.2	-.2	-.3	-.3	-.3	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.2	-.2	-.2	-.2	-.2

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

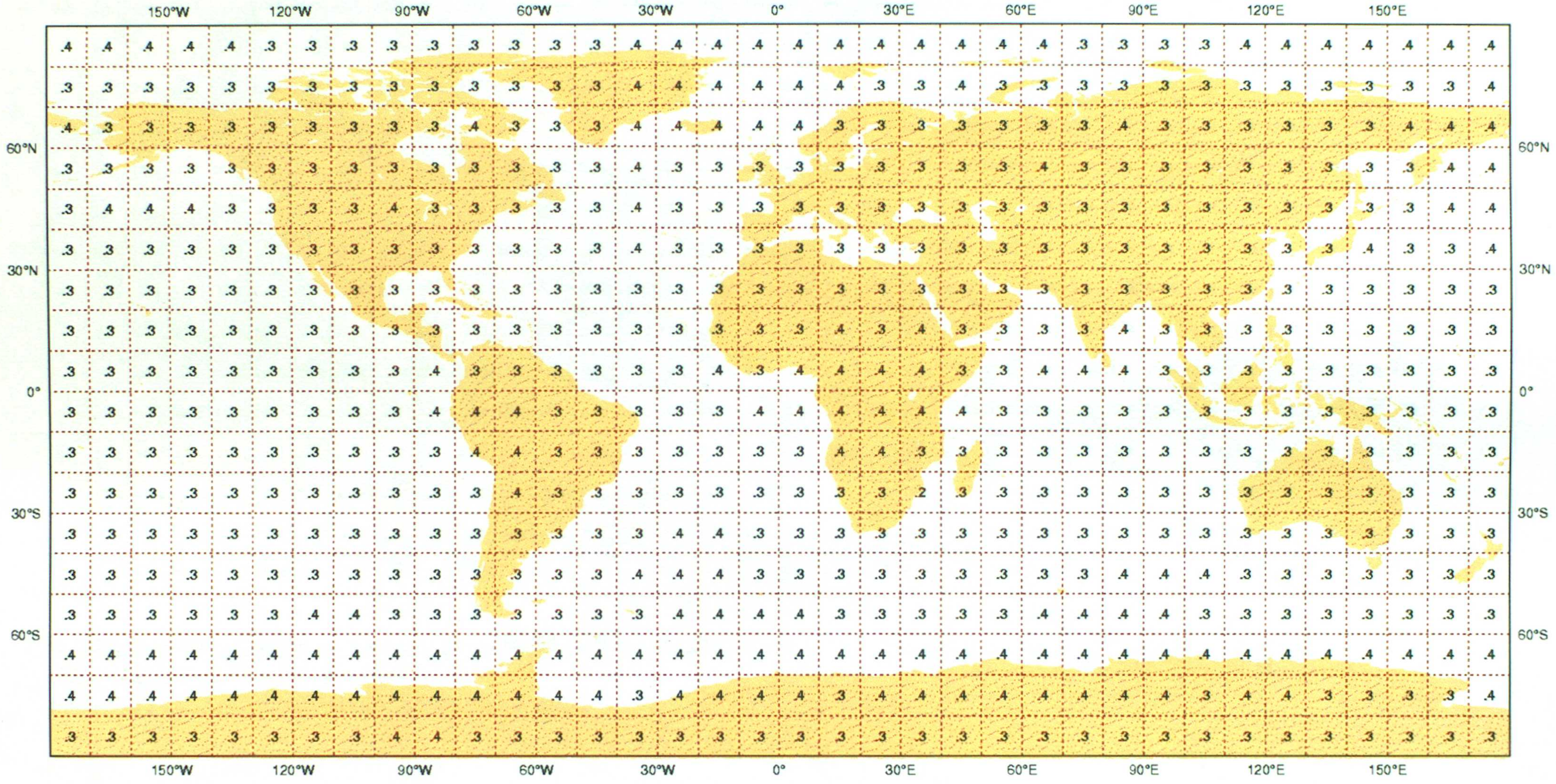
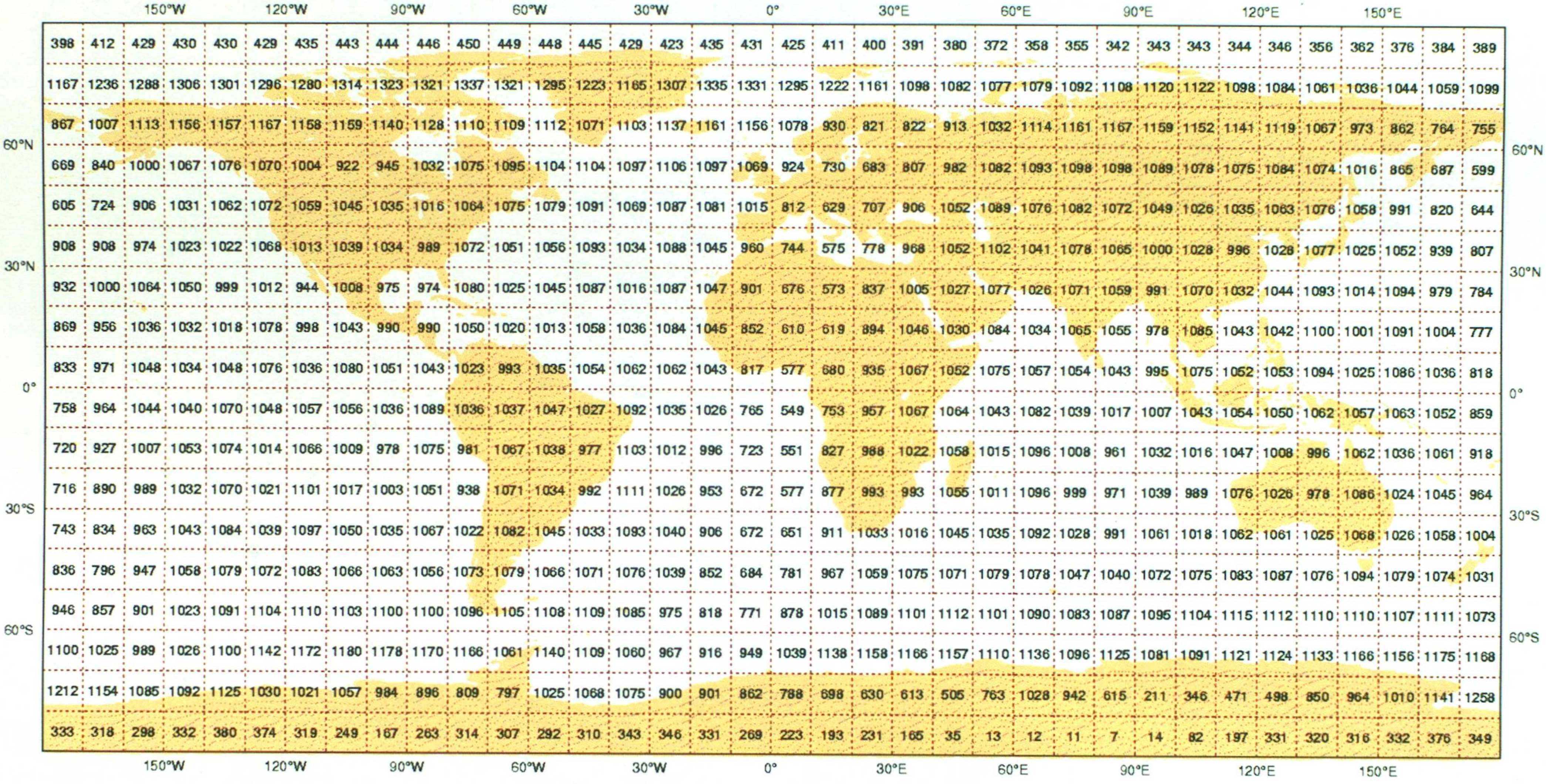
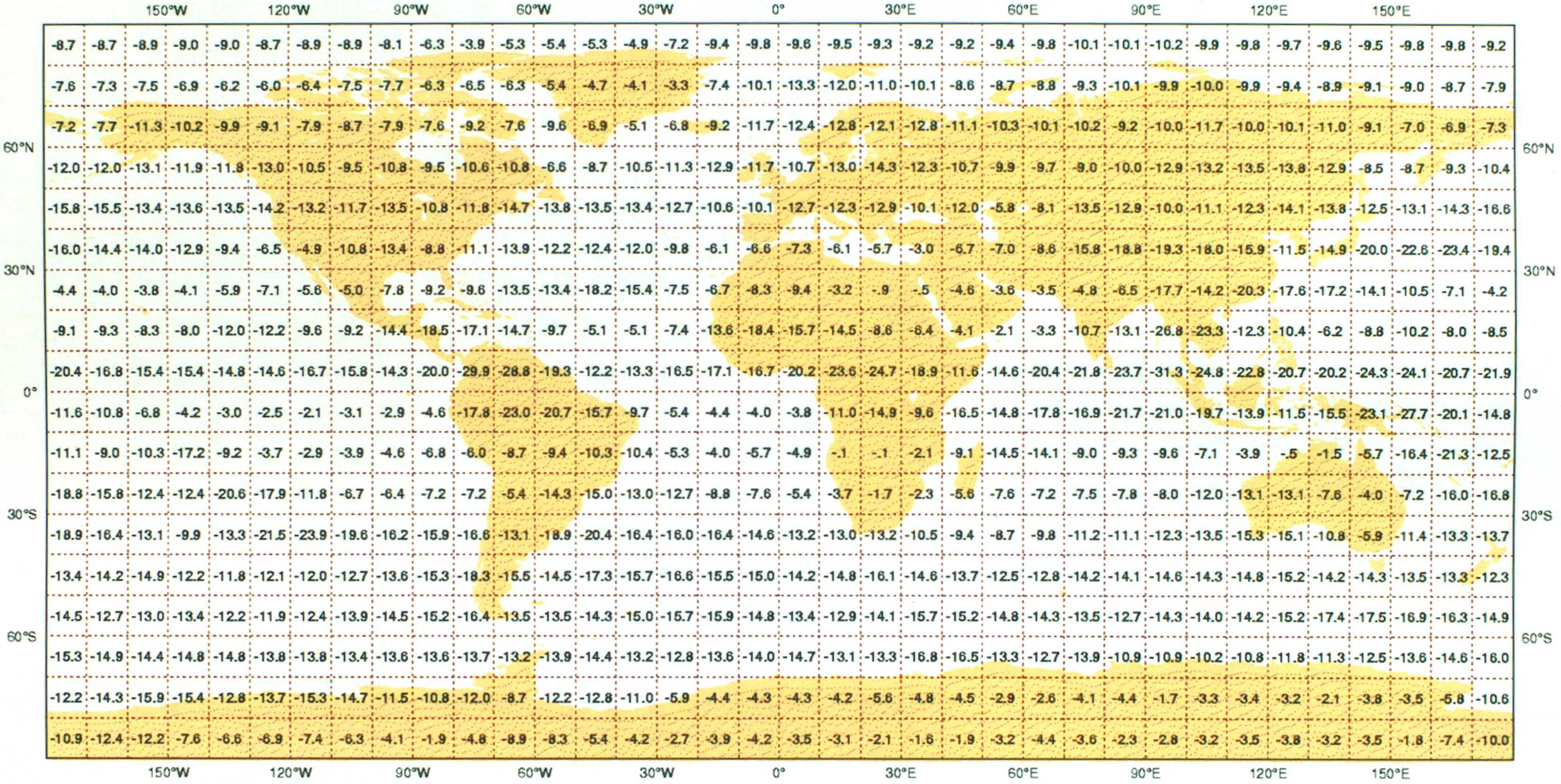

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4
.3 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3

Figure 40. ATOVS mean daily count. MAY 2005
NOAA16, using all observations
Global average number of observations in 24 hours = 607396



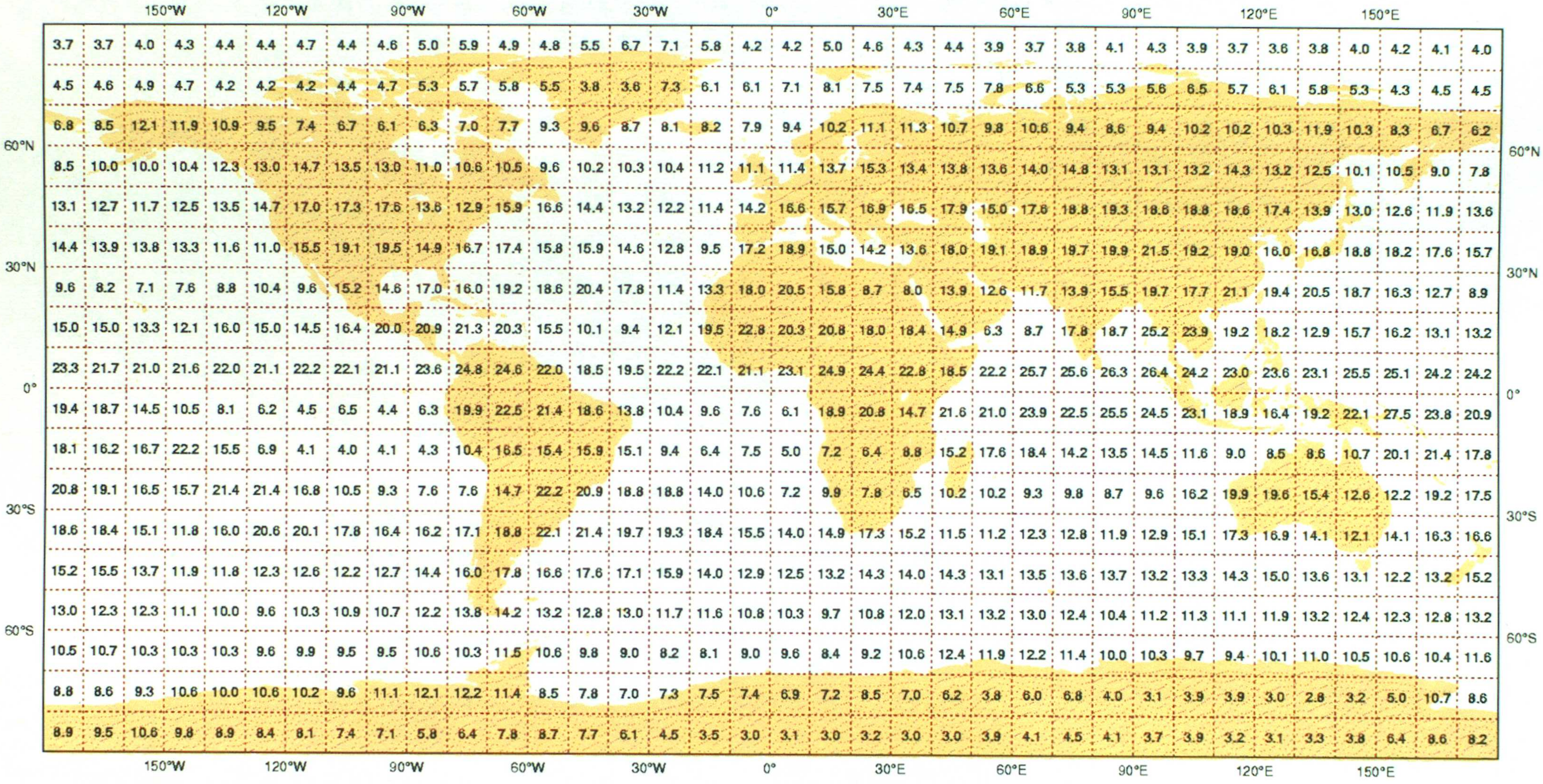
398	412	429	430	430	429	435	443	444	446	450	449	448	445	429	423	435	431	425	411	400	391	380	372	358	355	342	343	343	344	346	356	362	376	384	389
1167	1236	1288	1306	1301	1296	1280	1314	1323	1321	1337	1321	1295	1223	1165	1307	1335	1331	1295	1222	1161	1098	1082	1077	1079	1092	1108	1120	1122	1098	1084	1061	1036	1044	1059	1099
867	1007	1113	1156	1157	1167	1158	1159	1140	1128	1110	1109	1112	1071	1103	1137	1161	1156	1078	930	821	822	913	1032	1114	1161	1167	1159	1152	1141	1119	1067	973	862	764	755
669	840	1000	1067	1076	1070	1004	922	945	1032	1075	1095	1104	1104	1097	1106	1097	1069	924	730	683	807	982	1082	1093	1098	1098	1089	1078	1075	1084	1074	1016	865	687	599
605	724	906	1031	1062	1072	1059	1045	1035	1016	1064	1075	1079	1091	1069	1087	1081	1015	812	629	707	906	1052	1089	1076	1082	1072	1049	1026	1035	1063	1076	1058	991	820	644
908	908	974	1023	1022	1068	1013	1039	1034	989	1072	1051	1056	1093	1034	1088	1045	960	744	575	778	968	1052	1102	1041	1078	1065	1000	1028	996	1028	1077	1025	1052	939	807
932	1000	1064	1050	999	1012	944	1008	975	974	1080	1025	1045	1087	1016	1087	1047	901	676	573	837	1005	1027	1077	1026	1071	1059	991	1070	1032	1044	1093	1014	1094	979	784
869	956	1036	1032	1018	1078	998	1043	990	990	1050	1020	1013	1058	1036	1084	1045	852	610	619	894	1046	1030	1084	1034	1065	1055	978	1085	1043	1042	1100	1001	1091	1004	777
833	971	1048	1034	1048	1076	1036	1080	1051	1043	1023	993	1035	1054	1062	1062	1043	817	577	680	935	1067	1052	1075	1057	1054	1043	995	1075	1052	1053	1094	1025	1086	1036	818
758	964	1044	1040	1070	1048	1057	1056	1036	1089	1036	1037	1047	1027	1092	1035	1026	765	549	753	957	1067	1064	1043	1082	1039	1017	1007	1043	1054	1050	1062	1057	1063	1052	859
720	927	1007	1053	1074	1014	1066	1009	978	1075	981	1067	1038	977	1103	1012	996	723	551	827	988	1022	1058	1015	1096	1008	961	1032	1016	1047	1008	996	1062	1036	1061	918
716	890	989	1032	1070	1021	1101	1017	1003	1051	938	1071	1034	992	1111	1026	953	672	577	877	993	993	1055	1011	1096	999	971	1039	989	1076	1026	978	1086	1024	1045	964
743	834	963	1043	1084	1039	1097	1050	1035	1067	1022	1082	1045	1033	1093	1040	906	672	651	911	1033	1016	1045	1035	1092	1028	991	1061	1018	1062	1061	1025	1068	1026	1058	1004
836	796	947	1058	1079	1072	1083	1066	1063	1056	1073	1079	1066	1071	1076	1039	852	684	781	967	1059	1075	1071	1079	1078	1047	1040	1072	1075	1083	1087	1076	1094	1079	1074	1031
946	857	901	1023	1091	1104	1110	1103	1100	1100	1096	1105	1108	1109	1085	975	818	771	878	1015	1089	1101	1112	1101	1090	1083	1087	1095	1104	1115	1112	1110	1110	1107	1111	1073
1100	1025	989	1026	1100	1142	1172	1180	1178	1170	1166	1061	1140	1109	1060	967	916	949	1039	1138	1158	1166	1157	1110	1136	1096	1125	1081	1091	1121	1124	1133	1166	1156	1175	1168
1212	1154	1085	1092	1125	1030	1021	1057	984	896	809	797	1025	1068	1075	900	901	862	788	698	630	613	505	763	1028	942	615	211	346	471	498	850	964	1010	1141	1258
333	318	298	332	380	374	319	249	167	263	314	307	292	310	343	346	331	269	223	193	231	165	35	13	12	11	7	14	82	197	331	320	316	332	376	349

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS8 (Surface)
NOAA16, using all observations



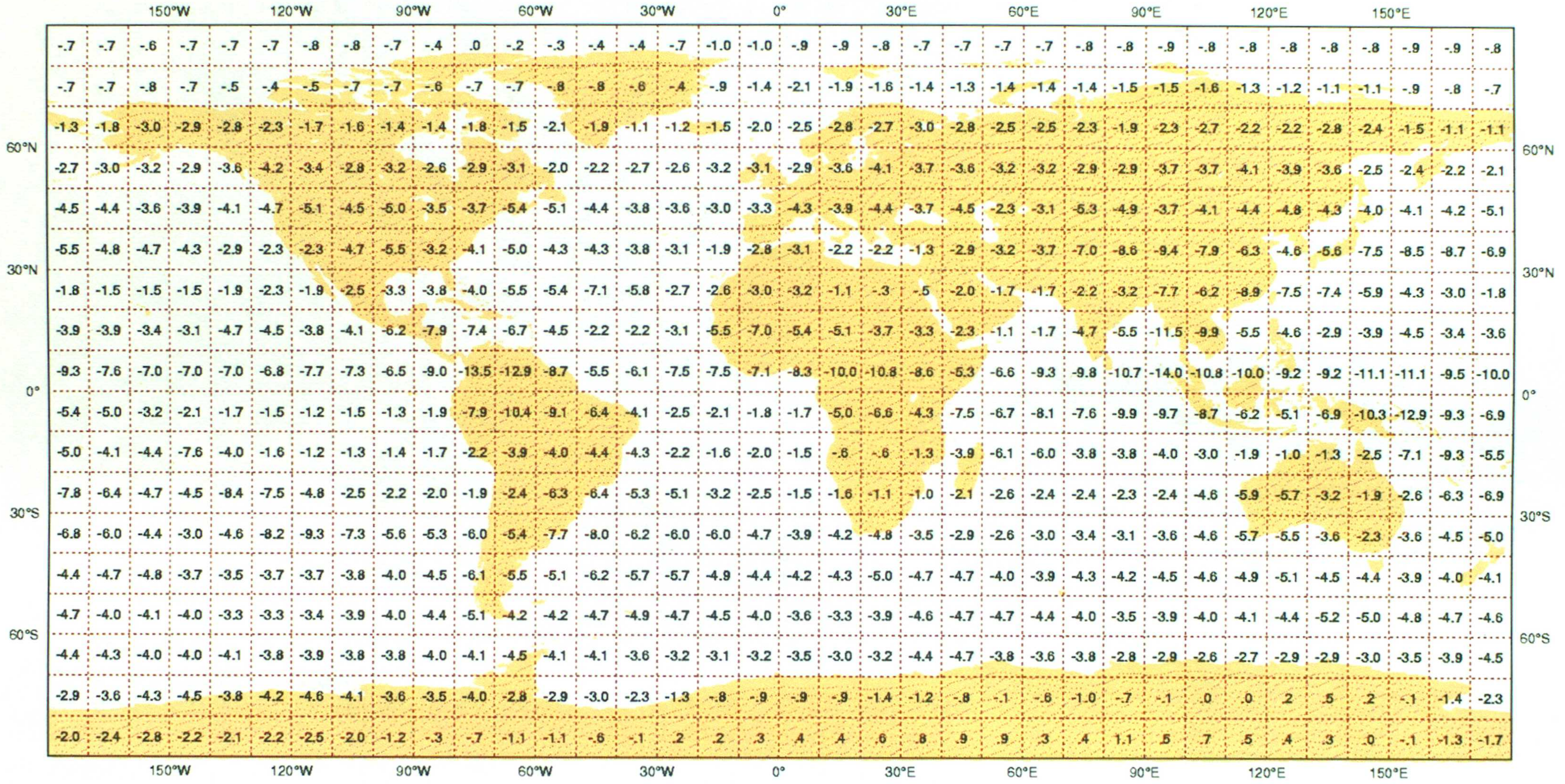
-8.7	-8.7	-8.9	-9.0	-9.0	-8.7	-8.9	-8.9	-8.1	-6.3	-3.9	-5.3	-5.4	-5.3	-4.9	-7.2	-9.4	-9.8	-9.6	-9.5	-9.3	-9.2	-9.2	-9.4	-9.8	-10.1	-10.1	-10.2	-9.9	-9.8	-9.7	-9.6	-9.5	-9.8	-9.8	-9.2
-7.6	-7.3	-7.5	-6.9	-6.2	-6.0	-6.4	-7.5	-7.7	-6.3	-6.5	-6.3	-5.4	-4.7	-4.1	-3.3	-7.4	-10.1	-13.3	-12.0	-11.0	-10.1	-8.6	-8.7	-8.8	-9.3	-10.1	-9.9	-10.0	-9.9	-9.4	-8.9	-9.1	-9.0	-8.7	-7.9
-7.2	-7.7	-11.3	-10.2	-9.9	-9.1	-7.9	-8.7	-7.9	-7.6	-9.2	-7.6	-9.6	-6.9	-5.1	-6.8	-9.2	-11.7	-12.4	-12.8	-12.1	-12.8	-11.1	-10.3	-10.1	-10.2	-9.2	-10.0	-11.7	-10.0	-10.1	-11.0	-9.1	-7.0	-6.9	-7.3
-12.0	-12.0	-13.1	-11.9	-11.8	-13.0	-10.5	-9.5	-10.8	-9.5	-10.6	-10.8	-6.6	-8.7	-10.5	-11.3	-12.9	-11.7	-10.7	-13.0	-14.3	-12.3	-10.7	-9.9	-9.7	-9.0	-10.0	-12.9	-13.2	-13.5	-13.8	-12.9	-8.5	-8.7	-9.3	-10.4
-15.8	-15.5	-13.4	-13.6	-13.5	-14.2	-13.2	-11.7	-13.5	-10.8	-11.8	-14.7	-13.8	-13.5	-13.4	-12.7	-10.6	-10.1	-12.7	-12.3	-12.9	-10.1	-12.0	-5.8	-8.1	-13.5	-12.9	-10.0	-11.1	-12.3	-14.1	-13.8	-12.5	-13.1	-14.3	-16.6
-16.0	-14.4	-14.0	-12.9	-9.4	-6.5	-4.9	-10.8	-13.4	-8.8	-11.1	-13.9	-12.2	-12.4	-12.0	-9.8	-6.1	-6.6	-7.3	-6.1	-5.7	-3.0	-6.7	-7.0	-8.6	-15.8	-18.8	-19.3	-18.0	-15.9	-11.5	-14.9	-20.0	-22.6	-23.4	-19.4
-4.4	-4.0	-3.8	-4.1	-5.9	-7.1	-5.6	-5.0	-7.8	-9.2	-9.6	-13.5	-13.4	-18.2	-15.4	-7.5	-6.7	-8.3	-9.4	-3.2	-.9	-.5	-4.6	-3.6	-3.5	-4.8	-6.5	-17.7	-14.2	-20.3	-17.6	-17.2	-14.1	-10.5	-7.1	-4.2
-9.1	-9.3	-8.3	-8.0	-12.0	-12.2	-9.6	-9.2	-14.4	-18.5	-17.1	-14.7	-9.7	-5.1	-5.1	-7.4	-13.6	-18.4	-15.7	-14.5	-8.6	-6.4	-4.1	-2.1	-3.3	-10.7	-13.1	-26.8	-23.3	-12.3	-10.4	-6.2	-8.8	-10.2	-8.0	-8.5
-20.4	-16.8	-15.4	-15.4	-14.8	-14.6	-16.7	-15.8	-14.3	-20.0	-29.9	-28.8	-19.3	-12.2	-13.3	-16.5	-17.1	-16.7	-20.2	-23.6	-24.7	-18.9	-11.6	-14.6	-20.4	-21.8	-23.7	-31.3	-24.8	-22.8	-20.7	-20.2	-24.3	-24.1	-20.7	-21.9
-11.6	-10.8	-6.8	-4.2	-3.0	-2.5	-2.1	-3.1	-2.9	-4.6	-17.8	-23.0	-20.7	-15.7	-9.7	-5.4	-4.4	-4.0	-3.8	-11.0	-14.9	-9.6	-16.5	-14.8	-17.8	-16.9	-21.7	-21.0	-19.7	-13.9	-11.5	-15.5	-23.1	-27.7	-20.1	-14.8
-11.1	-9.0	-10.3	-17.2	-9.2	-3.7	-2.9	-3.9	-4.6	-6.8	-6.0	-8.7	-9.4	-10.3	-10.4	-5.3	-4.0	-5.7	-4.9	-.1	-.1	-2.1	-9.1	-14.5	-14.1	-9.0	-9.3	-9.6	-7.1	-3.9	-.5	-1.5	-5.7	-16.4	-21.3	-12.5
-18.8	-15.8	-12.4	-12.4	-20.6	-17.9	-11.8	-6.7	-6.4	-7.2	-7.2	-5.4	-14.3	-15.0	-13.0	-12.7	-8.8	-7.6	-5.4	-3.7	-1.7	-2.3	-5.6	-7.6	-7.2	-7.5	-7.8	-8.0	-12.0	-13.1	-13.1	-7.6	-4.0	-7.2	-16.0	-16.8
-18.9	-16.4	-13.1	-9.9	-13.3	-21.5	-23.9	-19.6	-16.2	-15.9	-16.6	-13.1	-18.9	-20.4	-16.4	-16.0	-16.4	-14.6	-13.2	-13.0	-13.2	-10.5	-9.4	-8.7	-9.8	-11.2	-11.1	-12.3	-13.5	-15.3	-15.1	-10.8	-5.9	-11.4	-13.3	-13.7
-13.4	-14.2	-14.9	-12.2	-11.8	-12.1	-12.0	-12.7	-13.6	-15.3	-18.3	-15.5	-14.5	-17.3	-15.7	-16.6	-15.5	-15.0	-14.2	-14.8	-16.1	-14.6	-13.7	-12.5	-12.8	-14.2	-14.1	-14.6	-14.3	-14.8	-15.2	-14.2	-14.3	-13.5	-13.3	-12.3
-14.5	-12.7	-13.0	-13.4	-12.2	-11.9	-12.4	-13.9	-14.5	-15.2	-16.4	-13.5	-13.5	-14.3	-15.0	-15.7	-15.9	-14.8	-13.4	-12.9	-14.1	-15.7	-15.2	-14.8	-14.3	-13.5	-12.7	-14.3	-14.0	-14.2	-15.2	-17.4	-17.5	-16.9	-16.3	-14.9
-15.3	-14.9	-14.4	-14.8	-14.8	-13.8	-13.8	-13.4	-13.6	-13.6	-13.7	-13.2	-13.9	-14.4	-13.2	-12.8	-13.6	-14.0	-14.7	-13.1	-13.3	-16.8	-16.5	-13.3	-12.7	-13.9	-10.9	-10.9	-10.2	-10.8	-11.8	-11.3	-12.5	-13.6	-14.6	-16.0
-12.2	-14.3	-15.9	-15.4	-12.8	-13.7	-15.3	-14.7	-11.5	-10.8	-12.0	-8.7	-12.2	-12.8	-11.0	-5.9	-4.4	-4.3	-4.3	-4.2	-5.6	-4.8	-4.5	-2.9	-2.6	-4.1	-4.4	-1.7	-3.3	-3.4	-3.2	-2.1	-3.8	-3.5	-5.8	-10.6
-10.9	-12.4	-12.2	-7.6	-6.6	-6.9	-7.4	-6.3	-4.1	-1.9	-4.8	-8.9	-8.3	-5.4	-4.2	-2.7	-3.9	-4.2	-3.5	-3.1	-2.1	-1.6	-1.9	-3.2	-4.4	-3.6	-2.3	-2.8	-3.2	-3.5	-3.8	-3.2	-3.5	-1.8	-7.4	-10.0

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS8 (Surface)
NOAA16, using all observations



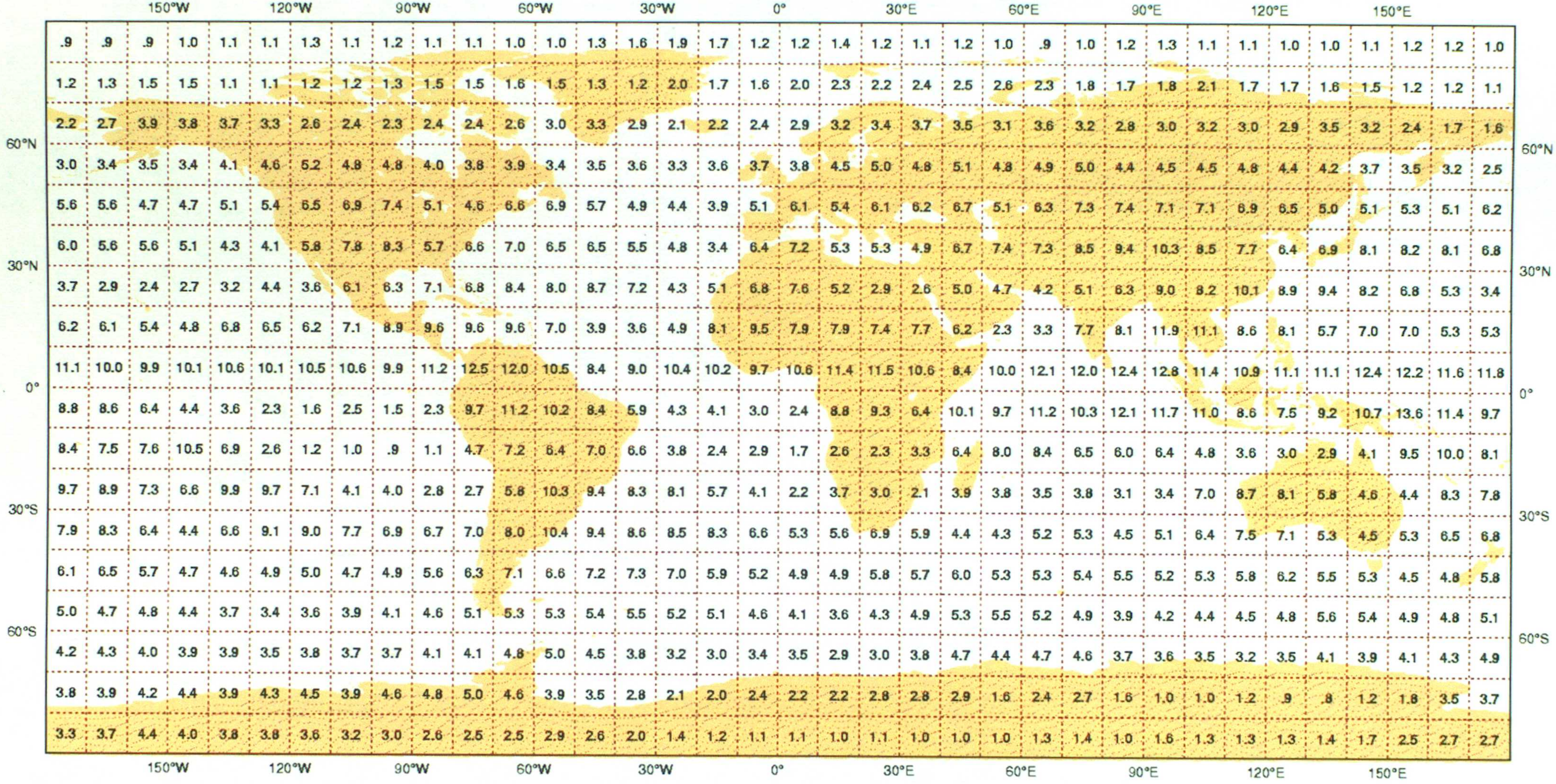
3.7	3.7	4.0	4.3	4.4	4.4	4.7	4.4	4.6	5.0	5.9	4.9	4.8	5.5	6.7	7.1	5.8	4.2	4.2	5.0	4.6	4.3	4.4	3.9	3.7	3.8	4.1	4.3	3.9	3.7	3.6	3.8	4.0	4.2	4.1	4.0
4.5	4.6	4.9	4.7	4.2	4.2	4.2	4.4	4.7	5.3	5.7	5.8	5.5	3.8	3.6	7.3	6.1	6.1	7.1	8.1	7.5	7.4	7.5	7.8	6.6	5.3	5.3	5.6	6.5	5.7	6.1	5.8	5.3	4.3	4.5	4.5
6.8	8.5	12.1	11.9	10.9	9.5	7.4	6.7	6.1	6.3	7.0	7.7	9.3	9.6	8.7	8.1	8.2	7.9	9.4	10.2	11.1	11.3	10.7	9.8	10.6	9.4	8.6	9.4	10.2	10.2	10.3	11.9	10.3	8.3	6.7	6.2
8.5	10.0	10.0	10.4	12.3	13.0	14.7	13.5	13.0	11.0	10.6	10.5	9.6	10.2	10.3	10.4	11.2	11.1	11.4	13.7	15.3	13.4	13.8	13.6	14.0	14.8	13.1	13.1	13.2	14.3	13.2	12.5	10.1	10.5	9.0	7.8
13.1	12.7	11.7	12.5	13.5	14.7	17.0	17.3	17.6	13.6	12.9	15.9	16.6	14.4	13.2	12.2	11.4	14.2	16.6	15.7	16.9	16.5	17.9	15.0	17.6	18.8	19.3	18.6	18.8	18.6	17.4	13.9	13.0	12.6	11.9	13.6
14.4	13.9	13.8	13.3	11.6	11.0	15.5	19.1	19.5	14.9	16.7	17.4	15.8	15.9	14.6	12.8	9.5	17.2	18.9	15.0	14.2	13.6	18.0	19.1	18.9	19.7	19.9	21.5	19.2	19.0	16.0	16.8	18.8	18.2	17.6	15.7
9.6	8.2	7.1	7.6	8.8	10.4	9.6	15.2	14.6	17.0	16.0	19.2	18.6	20.4	17.8	11.4	13.3	18.0	20.5	15.8	8.7	8.0	13.9	12.6	11.7	13.9	15.5	19.7	17.7	21.1	19.4	20.5	18.7	16.3	12.7	8.9
15.0	15.0	13.3	12.1	16.0	15.0	14.5	16.4	20.0	20.9	21.3	20.3	15.5	10.1	9.4	12.1	19.5	22.8	20.3	20.8	18.0	18.4	14.9	6.3	8.7	17.8	18.7	25.2	23.9	19.2	18.2	12.9	15.7	16.2	13.1	13.2
23.3	21.7	21.0	21.6	22.0	21.1	22.2	22.1	21.1	23.6	24.8	24.6	22.0	18.5	19.5	22.2	22.1	21.1	23.1	24.9	24.4	22.8	18.5	22.2	25.7	25.6	26.3	26.4	24.2	23.0	23.6	23.1	25.5	25.1	24.2	24.2
19.4	18.7	14.5	10.5	8.1	6.2	4.5	6.5	4.4	6.3	19.9	22.5	21.4	18.6	13.8	10.4	9.6	7.6	6.1	18.9	20.8	14.7	21.6	21.0	23.9	22.5	25.5	24.5	23.1	18.9	16.4	19.2	22.1	27.5	23.8	20.9
18.1	16.2	16.7	22.2	15.5	6.9	4.1	4.0	4.1	4.3	10.4	16.5	15.4	15.9	15.1	9.4	6.4	7.5	5.0	7.2	6.4	8.8	15.2	17.6	18.4	14.2	13.5	14.5	11.6	9.0	8.5	8.6	10.7	20.1	21.4	17.8
20.8	19.1	16.5	15.7	21.4	21.4	16.8	10.5	9.3	7.6	7.6	14.7	22.2	20.9	18.8	18.8	14.0	10.6	7.2	9.9	7.8	6.5	10.2	10.2	9.3	9.8	8.7	9.6	16.2	19.9	19.6	15.4	12.6	12.2	19.2	17.5
18.6	18.4	15.1	11.8	16.0	20.6	20.1	17.8	16.4	16.2	17.1	18.8	22.1	21.4	19.7	19.3	18.4	15.5	14.0	14.9	17.3	15.2	11.5	11.2	12.3	12.8	11.9	12.9	15.1	17.3	16.9	14.1	12.1	14.1	16.3	16.6
15.2	15.5	13.7	11.9	11.8	12.3	12.6	12.2	12.7	14.4	16.0	17.8	16.6	17.6	17.1	15.9	14.0	12.9	12.5	13.2	14.3	14.0	14.3	13.1	13.5	13.6	13.7	13.2	13.3	14.3	15.0	13.6	13.1	12.2	13.2	15.2
13.0	12.3	12.3	11.1	10.0	9.6	10.3	10.9	10.7	12.2	13.8	14.2	13.2	12.8	13.0	11.7	11.6	10.8	10.3	9.7	10.8	12.0	13.1	13.2	13.0	12.4	10.4	11.2	11.3	11.1	11.9	13.2	12.4	12.3	12.8	13.2
10.5	10.7	10.3	10.3	10.3	9.6	9.9	9.5	9.5	10.6	10.3	11.5	10.6	9.8	9.0	8.2	8.1	9.0	9.6	8.4	9.2	10.6	12.4	11.9	12.2	11.4	10.0	10.3	9.7	9.4	10.1	11.0	10.5	10.6	10.4	11.6
8.8	8.6	9.3	10.6	10.0	10.6	10.2	9.6	11.1	12.1	12.2	11.4	8.5	7.8	7.0	7.3	7.5	7.4	6.9	7.2	8.5	7.0	6.2	3.8	6.0	6.8	4.0	3.1	3.9	3.9	3.0	2.8	3.2	5.0	10.7	8.6
8.9	9.5	10.6	9.8	8.9	8.4	8.1	7.4	7.1	5.8	6.4	7.8	8.7	7.7	6.1	4.5	3.5	3.0	3.1	3.0	3.2	3.0	3.0	3.9	4.1	4.5	4.1	3.7	3.9	3.2	3.1	3.3	3.8	6.4	8.6	8.2

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



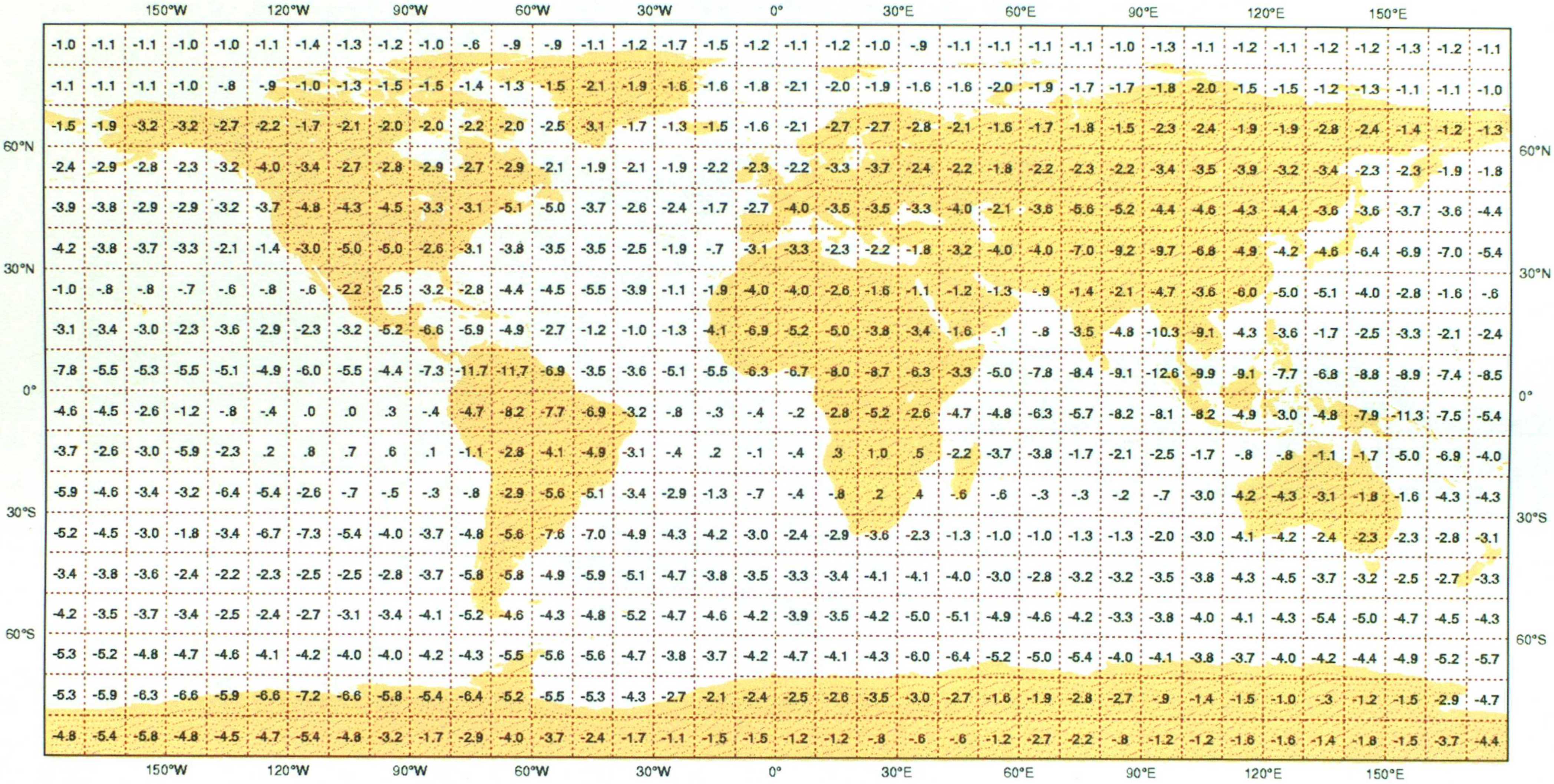
-.7	-.7	-.6	-.7	-.7	-.7	-.8	-.8	-.7	-.4	.0	-.2	-.3	-.4	-.4	-.7	-1.0	-1.0	-.9	-.9	-.8	-.7	-.7	-.7	-.7	-.8	-.8	-.9	-.8	-.8	-.8	-.8	-.8	-.9	-.9	-.8
-.7	-.7	-.8	-.7	-.5	-.4	-.5	-.7	-.7	-.6	-.7	-.7	-.8	-.8	-.6	-.4	-.9	-1.4	-2.1	-1.9	-1.6	-1.4	-1.3	-1.4	-1.4	-1.4	-1.5	-1.5	-1.6	-1.3	-1.2	-1.1	-1.1	-.9	-.8	-.7
-1.3	-1.8	-3.0	-2.9	-2.8	-2.3	-1.7	-1.6	-1.4	-1.4	-1.8	-1.5	-2.1	-1.9	-1.1	-1.2	-1.5	-2.0	-2.5	-2.8	-2.7	-3.0	-2.8	-2.5	-2.5	-2.3	-1.9	-2.3	-2.7	-2.2	-2.2	-2.8	-2.4	-1.5	-1.1	-1.1
-2.7	-3.0	-3.2	-2.9	-3.6	-4.2	-3.4	-2.8	-3.2	-2.6	-2.9	-3.1	-2.0	-2.2	-2.7	-2.6	-3.2	-3.1	-2.9	-3.6	-4.1	-3.7	-3.6	-3.2	-3.2	-2.9	-2.9	-3.7	-3.7	-4.1	-3.9	-3.6	-2.5	-2.4	-2.2	-2.1
-4.5	-4.4	-3.6	-3.9	-4.1	-4.7	-5.1	-4.5	-5.0	-3.5	-3.7	-5.4	-5.1	-4.4	-3.8	-3.6	-3.0	-3.3	-4.3	-3.9	-4.4	-3.7	-4.5	-2.3	-3.1	-5.3	-4.9	-3.7	-4.1	-4.4	-4.8	-4.3	-4.0	-4.1	-4.2	-5.1
-5.5	-4.8	-4.7	-4.3	-2.9	-2.3	-2.3	-4.7	-5.5	-3.2	-4.1	-5.0	-4.3	-4.3	-3.8	-3.1	-1.9	-2.8	-3.1	-2.2	-2.2	-1.3	-2.9	-3.2	-3.7	-7.0	-8.6	-9.4	-7.9	-6.3	-4.6	-5.6	-7.5	-8.5	-8.7	-6.9
-1.8	-1.5	-1.5	-1.5	-1.9	-2.3	-1.9	-2.5	-3.3	-3.8	-4.0	-5.5	-5.4	-7.1	-5.8	-2.7	-2.6	-3.0	-3.2	-1.1	-.3	-.5	-2.0	-1.7	-1.7	-2.2	-3.2	-7.7	-6.2	-8.9	-7.5	-7.4	-5.9	-4.3	-3.0	-1.8
-3.9	-3.9	-3.4	-3.1	-4.7	-4.5	-3.8	-4.1	-6.2	-7.9	-7.4	-6.7	-4.5	-2.2	-2.2	-3.1	-5.5	-7.0	-5.4	-5.1	-3.7	-3.3	-2.3	-1.1	-1.7	-4.7	-5.5	-11.5	-9.9	-5.5	-4.6	-2.9	-3.9	-4.5	-3.4	-3.6
-9.3	-7.6	-7.0	-7.0	-7.0	-6.8	-7.7	-7.3	-6.5	-9.0	-13.5	-12.9	-8.7	-5.5	-6.1	-7.5	-7.5	-7.1	-8.3	-10.0	-10.8	-8.6	-5.3	-6.6	-9.3	-9.8	-10.7	-14.0	-10.8	-10.0	-9.2	-9.2	-11.1	-11.1	-9.5	-10.0
-5.4	-5.0	-3.2	-2.1	-1.7	-1.5	-1.2	-1.5	-1.3	-1.9	-7.9	-10.4	-9.1	-6.4	-4.1	-2.5	-2.1	-1.8	-1.7	-5.0	-6.6	-4.3	-7.5	-6.7	-8.1	-7.6	-9.9	-9.7	-8.7	-6.2	-5.1	-6.9	-10.3	-12.9	-9.3	-6.9
-5.0	-4.1	-4.4	-7.6	-4.0	-1.6	-1.2	-1.3	-1.4	-1.7	-2.2	-3.9	-4.0	-4.4	-4.3	-2.2	-1.6	-2.0	-1.5	-.6	-.6	-1.3	-3.9	-6.1	-6.0	-3.8	-3.8	-4.0	-3.0	-1.9	-1.0	-1.3	-2.5	-7.1	-9.3	-5.5
-7.8	-6.4	-4.7	-4.5	-8.4	-7.5	-4.8	-2.5	-2.2	-2.0	-1.9	-2.4	-6.3	-6.4	-5.3	-5.1	-3.2	-2.5	-1.5	-1.6	-1.1	-1.0	-2.1	-2.6	-2.4	-2.4	-2.3	-2.4	-4.6	-5.9	-5.7	-3.2	-1.9	-2.6	-6.3	-6.9
-6.8	-6.0	-4.4	-3.0	-4.6	-8.2	-9.3	-7.3	-5.6	-5.3	-6.0	-5.4	-7.7	-8.0	-6.2	-6.0	-6.0	-4.7	-3.9	-4.2	-4.8	-3.5	-2.9	-2.6	-3.0	-3.4	-3.1	-3.6	-4.6	-5.7	-5.5	-3.6	-2.3	-3.6	-4.5	-5.0
-4.4	-4.7	-4.8	-3.7	-3.5	-3.7	-3.7	-3.8	-4.0	-4.5	-6.1	-5.5	-5.1	-6.2	-5.7	-5.7	-4.9	-4.4	-4.2	-4.3	-5.0	-4.7	-4.7	-4.0	-3.9	-4.3	-4.2	-4.5	-4.6	-4.9	-5.1	-4.5	-4.4	-3.9	-4.0	-4.1
-4.7	-4.0	-4.1	-4.0	-3.3	-3.3	-3.4	-3.9	-4.0	-4.4	-5.1	-4.2	-4.2	-4.7	-4.9	-4.7	-4.5	-4.0	-3.6	-3.3	-3.9	-4.6	-4.7	-4.7	-4.4	-4.0	-3.5	-3.9	-4.0	-4.1	-4.4	-5.2	-5.0	-4.8	-4.7	-4.6
-4.4	-4.3	-4.0	-4.0	-4.1	-3.8	-3.9	-3.8	-3.8	-4.0	-4.1	-4.5	-4.1	-4.1	-3.6	-3.2	-3.1	-3.2	-3.5	-3.0	-3.2	-4.4	-4.7	-3.8	-3.6	-3.8	-2.8	-2.9	-2.6	-2.7	-2.9	-2.9	-3.0	-3.5	-3.9	-4.5
-2.9	-3.6	-4.3	-4.5	-3.8	-4.2	-4.6	-4.1	-3.6	-3.5	-4.0	-2.8	-2.9	-3.0	-2.3	-1.3	-.8	-.9	-.9	-.9	-1.4	-1.2	-.8	-.1	-.6	-1.0	-.7	-.1	.0	.0	.2	.5	.2	-.1	-1.4	-2.3
-2.0	-2.4	-2.8	-2.2	-2.1	-2.2	-2.5	-2.0	-1.2	-.3	-.7	-1.1	-1.1	-.6	-.1	.2	.2	.3	.4	.4	.6	.8	.9	.9	.3	.4	1.1	.5	.7	.5	.4	.3	.0	-.1	-1.3	-1.7

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



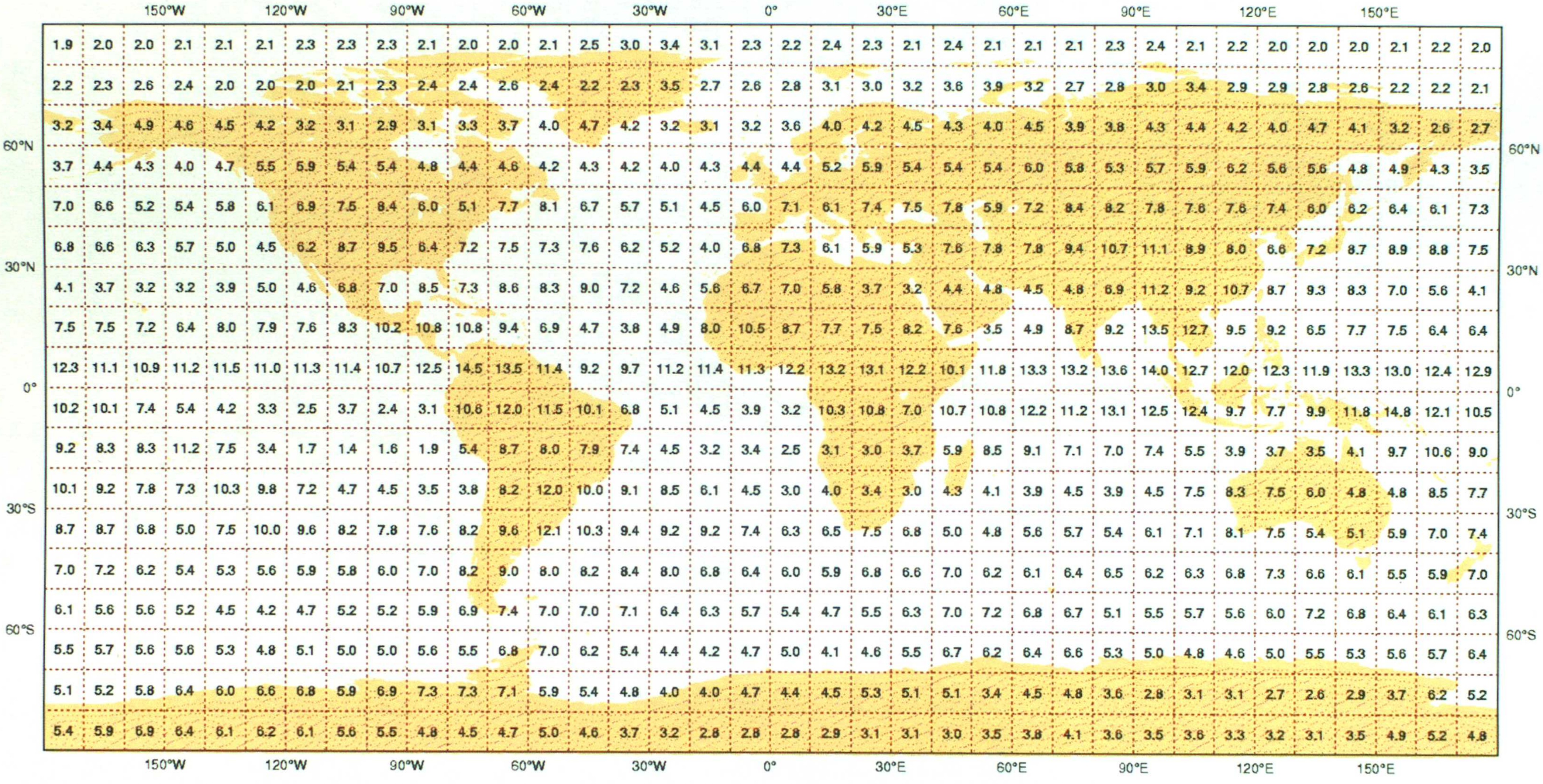
.9	.9	.9	1.0	1.1	1.1	1.3	1.1	1.2	1.1	1.1	1.0	1.0	1.3	1.6	1.9	1.7	1.2	1.2	1.4	1.2	1.1	1.2	1.0	.9	1.0	1.2	1.3	1.1	1.1	1.0	1.0	1.1	1.2	1.2	1.0
1.2	1.3	1.5	1.5	1.1	1.1	1.2	1.2	1.3	1.5	1.5	1.6	1.5	1.3	1.2	2.0	1.7	1.6	2.0	2.3	2.2	2.4	2.5	2.6	2.3	1.8	1.7	1.8	2.1	1.7	1.7	1.6	1.5	1.2	1.2	1.1
2.2	2.7	3.9	3.8	3.7	3.3	2.6	2.4	2.3	2.4	2.4	2.6	3.0	3.3	2.9	2.1	2.2	2.4	2.9	3.2	3.4	3.7	3.5	3.1	3.6	3.2	2.8	3.0	3.2	3.0	2.9	3.5	3.2	2.4	1.7	1.6
3.0	3.4	3.5	3.4	4.1	4.6	5.2	4.8	4.8	4.0	3.8	3.9	3.4	3.5	3.6	3.3	3.6	3.7	3.8	4.5	5.0	4.8	5.1	4.8	4.9	5.0	4.4	4.5	4.5	4.8	4.4	4.2	3.7	3.5	3.2	2.5
5.6	5.6	4.7	4.7	5.1	5.4	6.5	6.9	7.4	5.1	4.6	6.6	6.9	5.7	4.9	4.4	3.9	5.1	6.1	5.4	6.1	6.2	6.7	5.1	6.3	7.3	7.4	7.1	7.1	6.9	6.5	5.0	5.1	5.3	5.1	6.2
6.0	5.6	5.6	5.1	4.3	4.1	5.8	7.8	8.3	5.7	6.6	7.0	6.5	6.5	5.5	4.8	3.4	6.4	7.2	5.3	5.3	4.9	6.7	7.4	7.3	8.5	9.4	10.3	8.5	7.7	6.4	6.9	8.1	8.2	8.1	6.8
3.7	2.9	2.4	2.7	3.2	4.4	3.6	6.1	6.3	7.1	6.8	8.4	8.0	8.7	7.2	4.3	5.1	6.8	7.6	5.2	2.9	2.6	5.0	4.7	4.2	5.1	6.3	9.0	8.2	10.1	8.9	9.4	8.2	6.8	5.3	3.4
6.2	6.1	5.4	4.8	6.8	6.5	6.2	7.1	8.9	9.6	9.6	9.6	7.0	3.9	3.6	4.9	8.1	9.5	7.9	7.9	7.4	7.7	6.2	2.3	3.3	7.7	8.1	11.9	11.1	8.6	8.1	5.7	7.0	7.0	5.3	5.3
11.1	10.0	9.9	10.1	10.6	10.1	10.5	10.6	9.9	11.2	12.5	12.0	10.5	8.4	9.0	10.4	10.2	9.7	10.6	11.4	11.5	10.6	8.4	10.0	12.1	12.0	12.4	12.8	11.4	10.9	11.1	11.1	12.4	12.2	11.6	11.8
8.8	8.6	6.4	4.4	3.6	2.3	1.6	2.5	1.5	2.3	9.7	11.2	10.2	8.4	5.9	4.3	4.1	3.0	2.4	8.8	9.3	6.4	10.1	9.7	11.2	10.3	12.1	11.7	11.0	8.6	7.5	9.2	10.7	13.6	11.4	9.7
8.4	7.5	7.6	10.5	6.9	2.6	1.2	1.0	.9	1.1	4.7	7.2	6.4	7.0	6.6	3.8	2.4	2.9	1.7	2.6	2.3	3.3	6.4	8.0	8.4	6.5	6.0	6.4	4.8	3.6	3.0	2.9	4.1	9.5	10.0	8.1
9.7	8.9	7.3	6.6	9.9	9.7	7.1	4.1	4.0	2.8	2.7	5.8	10.3	9.4	8.3	8.1	5.7	4.1	2.2	3.7	3.0	2.1	3.9	3.8	3.5	3.8	3.1	3.4	7.0	8.7	8.1	5.8	4.6	4.4	8.3	7.8
7.9	8.3	6.4	4.4	6.6	9.1	9.0	7.7	6.9	6.7	7.0	8.0	10.4	9.4	8.6	8.5	8.3	6.6	5.3	5.6	6.9	5.9	4.4	4.3	5.2	5.3	4.5	5.1	6.4	7.5	7.1	5.3	4.5	5.3	6.5	6.8
6.1	6.5	5.7	4.7	4.6	4.9	5.0	4.7	4.9	5.6	6.3	7.1	6.6	7.2	7.3	7.0	5.9	5.2	4.9	4.9	5.8	5.7	6.0	5.3	5.3	5.4	5.5	5.2	5.3	5.8	6.2	5.5	5.3	4.5	4.8	5.8
5.0	4.7	4.8	4.4	3.7	3.4	3.6	3.9	4.1	4.6	5.1	5.3	5.3	5.4	5.5	5.2	5.1	4.6	4.1	3.6	4.3	4.9	5.3	5.5	5.2	4.9	3.9	4.2	4.4	4.5	4.8	5.6	5.4	4.9	4.8	5.1
4.2	4.3	4.0	3.9	3.9	3.5	3.8	3.7	3.7	4.1	4.1	4.8	5.0	4.5	3.8	3.2	3.0	3.4	3.5	2.9	3.0	3.8	4.7	4.4	4.7	4.6	3.7	3.6	3.5	3.2	3.5	4.1	3.9	4.1	4.3	4.9
3.8	3.9	4.2	4.4	3.9	4.3	4.5	3.9	4.6	4.8	5.0	4.6	3.9	3.5	2.8	2.1	2.0	2.4	2.2	2.2	2.8	2.8	2.9	1.6	2.4	2.7	1.6	1.0	1.0	1.2	.9	.8	1.2	1.8	3.5	3.7
3.3	3.7	4.4	4.0	3.8	3.8	3.6	3.2	3.0	2.6	2.5	2.5	2.9	2.6	2.0	1.4	1.2	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.3	1.4	1.0	1.6	1.3	1.3	1.3	1.4	1.7	2.5	2.7	2.7

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



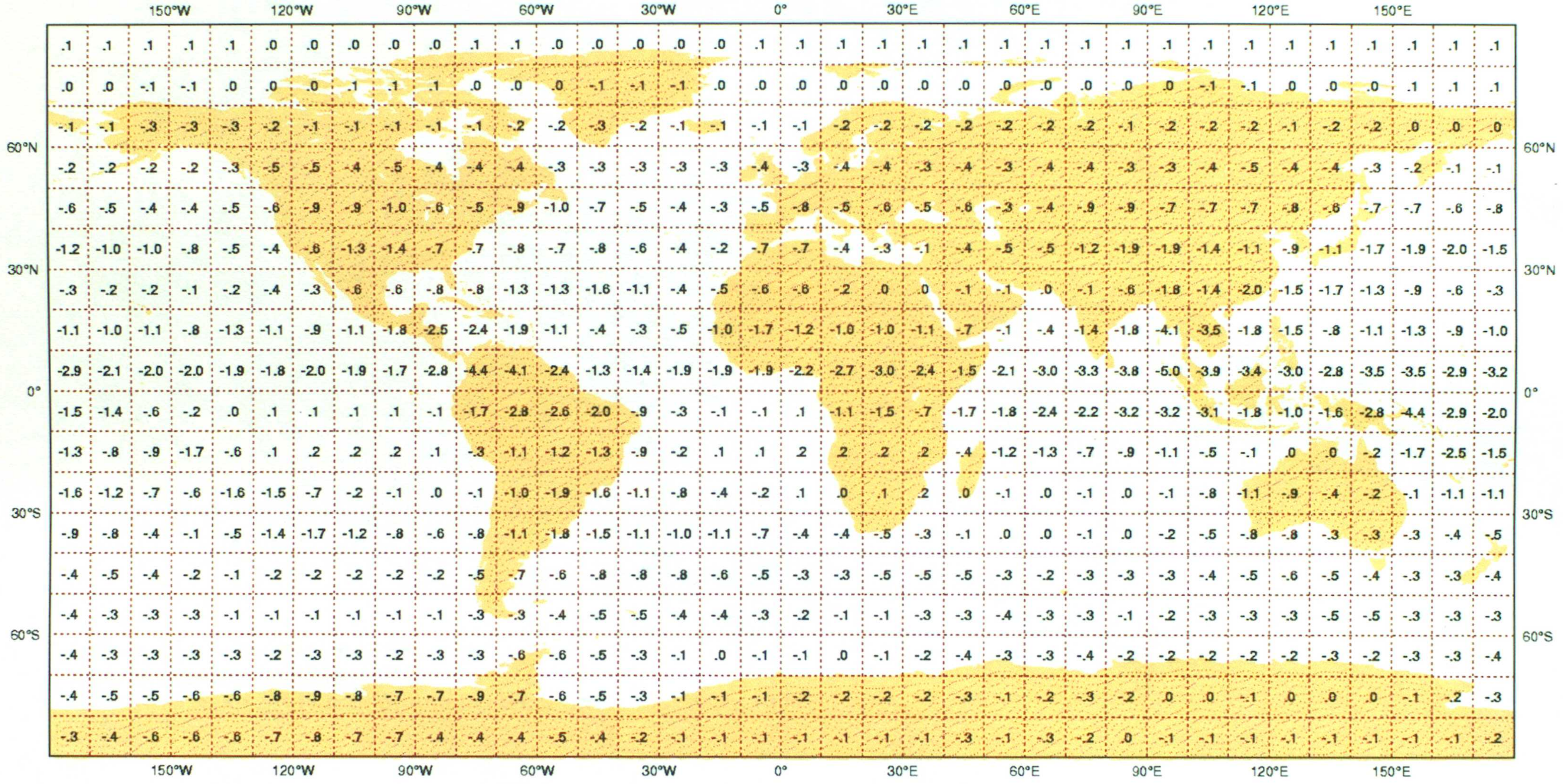
-1.0	-1.1	-1.1	-1.0	-1.0	-1.1	-1.4	-1.3	-1.2	-1.0	-.6	-.9	-.9	-1.1	-1.2	-1.7	-1.5	-1.2	-1.1	-1.2	-1.0	-.9	-1.1	-1.1	-1.1	-1.1	-1.0	-1.3	-1.1	-1.2	-1.1	-1.2	-1.2	-1.3	-1.2	-1.1
-1.1	-1.1	-1.1	-1.0	-.8	-.9	-1.0	-1.3	-1.5	-1.5	-1.4	-1.3	-1.5	-2.1	-1.9	-1.6	-1.6	-1.8	-2.1	-2.0	-1.9	-1.6	-1.6	-2.0	-1.9	-1.7	-1.7	-1.8	-2.0	-1.5	-1.5	-1.2	-1.3	-1.1	-1.1	-1.0
-1.5	-1.9	-3.2	-3.2	-2.7	-2.2	-1.7	-2.1	-2.0	-2.0	-2.2	-2.0	-2.5	-3.1	-1.7	-1.3	-1.5	-1.6	-2.1	-2.7	-2.7	-2.8	-2.1	-1.6	-1.7	-1.8	-1.5	-2.3	-2.4	-1.9	-1.9	-2.8	-2.4	-1.4	-1.2	-1.3
-2.4	-2.9	-2.8	-2.3	-3.2	-4.0	-3.4	-2.7	-2.8	-2.9	-2.7	-2.9	-2.1	-1.9	-2.1	-1.9	-2.2	-2.3	-2.2	-3.3	-3.7	-2.4	-2.2	-1.8	-2.2	-2.3	-2.2	-3.4	-3.5	-3.9	-3.2	-3.4	-2.3	-2.3	-1.9	-1.8
-3.9	-3.8	-2.9	-2.9	-3.2	-3.7	-4.8	-4.3	-4.5	-3.3	-3.1	-5.1	-5.0	-3.7	-2.6	-2.4	-1.7	-2.7	-4.0	-3.5	-3.5	-3.3	-4.0	-2.1	-3.6	-5.6	-5.2	-4.4	-4.6	-4.3	-4.4	-3.6	-3.6	-3.7	-3.6	-4.4
-4.2	-3.8	-3.7	-3.3	-2.1	-1.4	-3.0	-5.0	-5.0	-2.6	-3.1	-3.8	-3.5	-3.5	-2.5	-1.9	-.7	-3.1	-3.3	-2.3	-2.2	-1.8	-3.2	-4.0	-4.0	-7.0	-9.2	-9.7	-6.8	-4.9	-4.2	-4.6	-6.4	-6.9	-7.0	-5.4
-1.0	-.8	-.8	-.7	-.6	-.8	-.6	-2.2	-2.5	-3.2	-2.8	-4.4	-4.5	-5.5	-3.9	-1.1	-1.9	-4.0	-4.0	-2.6	-1.6	-1.1	-1.2	-1.3	-.9	-1.4	-2.1	-4.7	-3.6	-6.0	-5.0	-5.1	-4.0	-2.8	-1.6	-.6
-3.1	-3.4	-3.0	-2.3	-3.6	-2.9	-2.3	-3.2	-5.2	-6.6	-5.9	-4.9	-2.7	-1.2	-1.0	-1.3	-4.1	-6.9	-5.2	-5.0	-3.8	-3.4	-1.6	-.1	-.8	-3.5	-4.8	-10.3	-9.1	-4.3	-3.6	-1.7	-2.5	-3.3	-2.1	-2.4
-7.8	-5.5	-5.3	-5.5	-5.1	-4.9	-6.0	-5.5	-4.4	-7.3	-11.7	-11.7	-6.9	-3.5	-3.6	-5.1	-5.5	-6.3	-6.7	-8.0	-8.7	-6.3	-3.3	-5.0	-7.8	-8.4	-9.1	-12.6	-9.9	-9.1	-7.7	-6.8	-8.8	-8.9	-7.4	-8.5
-4.6	-4.5	-2.6	-1.2	-.8	-.4	.0	.0	.3	-.4	-4.7	-8.2	-7.7	-6.9	-3.2	-.8	-.3	-.4	-.2	-2.8	-5.2	-2.6	-4.7	-4.8	-6.3	-5.7	-8.2	-8.1	-8.2	-4.9	-3.0	-4.8	-7.9	-11.3	-7.5	-5.4
-3.7	-2.6	-3.0	-5.9	-2.3	.2	.8	.7	.6	.1	-1.1	-2.8	-4.1	-4.9	-3.1	-.4	.2	-.1	-.4	.3	1.0	.5	-2.2	-3.7	-3.8	-1.7	-2.1	-2.5	-1.7	-.8	-.8	-1.1	-1.7	-5.0	-6.9	-4.0
-5.9	-4.6	-3.4	-3.2	-6.4	-5.4	-2.6	-.7	-.5	-.3	-.8	-2.9	-5.6	-5.1	-3.4	-2.9	-1.3	-.7	-.4	-.8	.2	.4	-.6	-.6	-.3	-.3	-.2	-.7	-3.0	-4.2	-4.3	-3.1	-1.8	-1.6	-4.3	-4.3
-5.2	-4.5	-3.0	-1.8	-3.4	-6.7	-7.3	-5.4	-4.0	-3.7	-4.8	-5.6	-7.6	-7.0	-4.9	-4.3	-4.2	-3.0	-2.4	-2.9	-3.6	-2.3	-1.3	-1.0	-1.0	-1.3	-1.3	-2.0	-3.0	-4.1	-4.2	-2.4	-2.3	-2.3	-2.8	-3.1
-3.4	-3.8	-3.6	-2.4	-2.2	-2.3	-2.5	-2.5	-2.8	-3.7	-5.8	-5.8	-4.9	-5.9	-5.1	-4.7	-3.8	-3.5	-3.3	-3.4	-4.1	-4.1	-4.0	-3.0	-2.8	-3.2	-3.2	-3.5	-3.8	-4.3	-4.5	-3.7	-3.2	-2.5	-2.7	-3.3
-4.2	-3.5	-3.7	-3.4	-2.5	-2.4	-2.7	-3.1	-3.4	-4.1	-5.2	-4.6	-4.3	-4.8	-5.2	-4.7	-4.6	-4.2	-3.9	-3.5	-4.2	-5.0	-5.1	-4.9	-4.6	-4.2	-3.3	-3.8	-4.0	-4.1	-4.3	-5.4	-5.0	-4.7	-4.5	-4.3
-5.3	-5.2	-4.8	-4.7	-4.6	-4.1	-4.2	-4.0	-4.0	-4.2	-4.3	-5.5	-5.6	-5.6	-4.7	-3.8	-3.7	-4.2	-4.7	-4.1	-4.3	-6.0	-6.4	-5.2	-5.0	-5.4	-4.0	-4.1	-3.8	-3.7	-4.0	-4.2	-4.4	-4.9	-5.2	-5.7
-5.3	-5.9	-6.3	-6.6	-5.9	-6.6	-7.2	-6.6	-5.8	-5.4	-6.4	-5.2	-5.5	-5.3	-4.3	-2.7	-2.1	-2.4	-2.5	-2.6	-3.5	-3.0	-2.7	-1.6	-1.9	-2.8	-2.7	-.9	-1.4	-1.5	-1.0	-.3	-1.2	-1.5	-2.9	-4.7
-4.8	-5.4	-5.8	-4.8	-4.5	-4.7	-5.4	-4.8	-3.2	-1.7	-2.9	-4.0	-3.7	-2.4	-1.7	-1.1	-1.5	-1.5	-1.2	-1.2	-.8	-.6	-.6	-1.2	-2.7	-2.2	-.8	-1.2	-1.2	-1.6	-1.6	-1.4	-1.8	-1.5	-3.7	-4.4

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



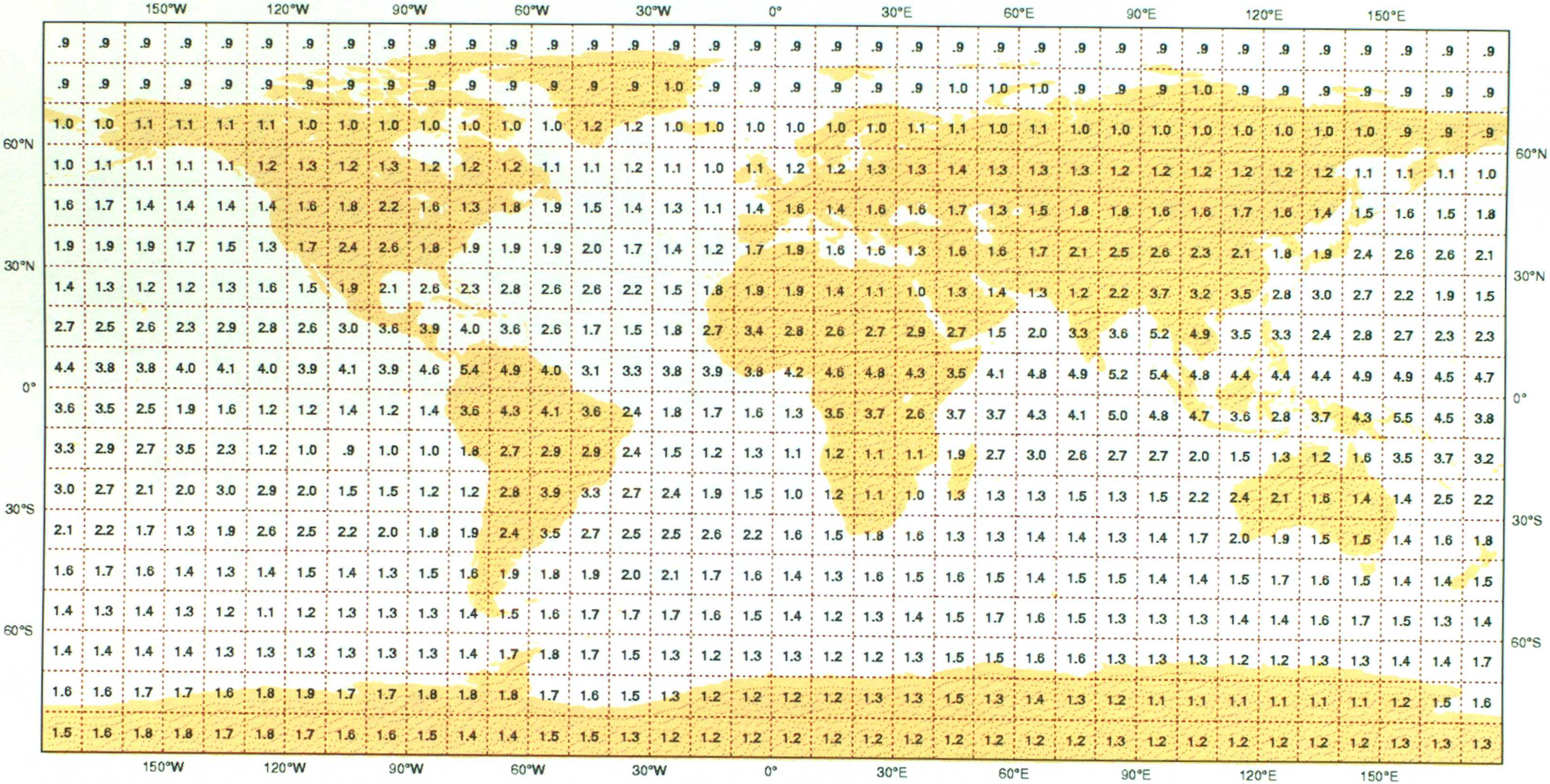
1.9	2.0	2.0	2.1	2.1	2.1	2.3	2.3	2.3	2.1	2.0	2.0	2.1	2.5	3.0	3.4	3.1	2.3	2.2	2.4	2.3	2.1	2.4	2.1	2.1	2.1	2.3	2.4	2.1	2.2	2.0	2.0	2.0	2.1	2.2	2.0
2.2	2.3	2.6	2.4	2.0	2.0	2.0	2.1	2.3	2.4	2.4	2.6	2.4	2.2	2.3	3.5	2.7	2.6	2.8	3.1	3.0	3.2	3.6	3.9	3.2	2.7	2.8	3.0	3.4	2.9	2.9	2.8	2.6	2.2	2.2	2.1
3.2	3.4	4.9	4.6	4.5	4.2	3.2	3.1	2.9	3.1	3.3	3.7	4.0	4.7	4.2	3.2	3.1	3.2	3.6	4.0	4.2	4.5	4.3	4.0	4.5	3.9	3.8	4.3	4.4	4.2	4.0	4.7	4.1	3.2	2.6	2.7
3.7	4.4	4.3	4.0	4.7	5.5	5.9	5.4	5.4	4.8	4.4	4.6	4.2	4.3	4.2	4.0	4.3	4.4	4.4	5.2	5.9	5.4	5.4	5.4	6.0	5.8	5.3	5.7	5.9	6.2	5.6	5.6	4.8	4.9	4.3	3.5
7.0	6.6	5.2	5.4	5.8	6.1	6.9	7.5	8.4	6.0	5.1	7.7	8.1	6.7	5.7	5.1	4.5	6.0	7.1	6.1	7.4	7.5	7.8	5.9	7.2	8.4	8.2	7.8	7.6	7.6	7.4	6.0	6.2	6.4	6.1	7.3
6.8	6.6	6.3	5.7	5.0	4.5	6.2	8.7	9.5	6.4	7.2	7.5	7.3	7.6	6.2	5.2	4.0	6.8	7.3	6.1	5.9	5.3	7.6	7.8	7.8	9.4	10.7	11.1	8.9	8.0	6.6	7.2	8.7	8.9	8.8	7.5
4.1	3.7	3.2	3.2	3.9	5.0	4.6	6.8	7.0	8.5	7.3	8.6	8.3	9.0	7.2	4.6	5.6	6.7	7.0	5.8	3.7	3.2	4.4	4.8	4.5	4.8	6.9	11.2	9.2	10.7	8.7	9.3	8.3	7.0	5.6	4.1
7.5	7.5	7.2	6.4	8.0	7.9	7.6	8.3	10.2	10.8	10.8	9.4	6.9	4.7	3.8	4.9	8.0	10.5	8.7	7.7	7.5	8.2	7.6	3.5	4.9	8.7	9.2	13.5	12.7	9.5	9.2	6.5	7.7	7.5	6.4	6.4
12.3	11.1	10.9	11.2	11.5	11.0	11.3	11.4	10.7	12.5	14.5	13.5	11.4	9.2	9.7	11.2	11.4	11.3	12.2	13.2	13.1	12.2	10.1	11.8	13.3	13.2	13.6	14.0	12.7	12.0	12.3	11.9	13.3	13.0	12.4	12.9
10.2	10.1	7.4	5.4	4.2	3.3	2.5	3.7	2.4	3.1	10.6	12.0	11.5	10.1	6.8	5.1	4.5	3.9	3.2	10.3	10.8	7.0	10.7	10.8	12.2	11.2	13.1	12.5	12.4	9.7	7.7	9.9	11.8	14.8	12.1	10.5
9.2	8.3	8.3	11.2	7.5	3.4	1.7	1.4	1.6	1.9	5.4	8.7	8.0	7.9	7.4	4.5	3.2	3.4	2.5	3.1	3.0	3.7	5.9	8.5	9.1	7.1	7.0	7.4	5.5	3.9	3.7	3.5	4.1	9.7	10.6	9.0
10.1	9.2	7.8	7.3	10.3	9.8	7.2	4.7	4.5	3.5	3.8	8.2	12.0	10.0	9.1	8.5	6.1	4.5	3.0	4.0	3.4	3.0	4.3	4.1	3.9	4.5	3.9	4.5	7.5	8.3	7.5	6.0	4.8	4.8	8.5	7.7
8.7	8.7	6.8	5.0	7.5	10.0	9.6	8.2	7.8	7.6	8.2	9.6	12.1	10.3	9.4	9.2	9.2	7.4	6.3	6.5	7.5	6.8	5.0	4.8	5.6	5.7	5.4	6.1	7.1	8.1	7.5	5.4	5.1	5.9	7.0	7.4
7.0	7.2	6.2	5.4	5.3	5.6	5.9	5.8	6.0	7.0	8.2	9.0	8.0	8.2	8.4	8.0	6.8	6.4	6.0	5.9	6.8	6.6	7.0	6.2	6.1	6.4	6.5	6.2	6.3	6.8	7.3	6.6	6.1	5.5	5.9	7.0
6.1	5.6	5.6	5.2	4.5	4.2	4.7	5.2	5.2	5.9	6.9	7.4	7.0	7.0	7.1	6.4	6.3	5.7	5.4	4.7	5.5	6.3	7.0	7.2	6.8	6.7	5.1	5.5	5.7	5.6	6.0	7.2	6.8	6.4	6.1	6.3
5.5	5.7	5.6	5.6	5.3	4.8	5.1	5.0	5.0	5.6	5.5	6.8	7.0	6.2	5.4	4.4	4.2	4.7	5.0	4.1	4.6	5.5	6.7	6.2	6.4	6.6	5.3	5.0	4.8	4.6	5.0	5.5	5.3	5.6	5.7	6.4
5.1	5.2	5.8	6.4	6.0	6.6	6.8	5.9	6.9	7.3	7.3	7.1	5.9	5.4	4.8	4.0	4.0	4.7	4.4	4.5	5.3	5.1	5.1	3.4	4.5	4.8	3.6	2.8	3.1	3.1	2.7	2.6	2.9	3.7	6.2	5.2
5.4	5.9	6.9	6.4	6.1	6.2	6.1	5.6	5.5	4.8	4.5	4.7	5.0	4.6	3.7	3.2	2.8	2.8	2.8	2.9	3.1	3.1	3.0	3.5	3.8	4.1	3.6	3.5	3.6	3.3	3.2	3.1	3.5	4.9	5.2	4.8

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



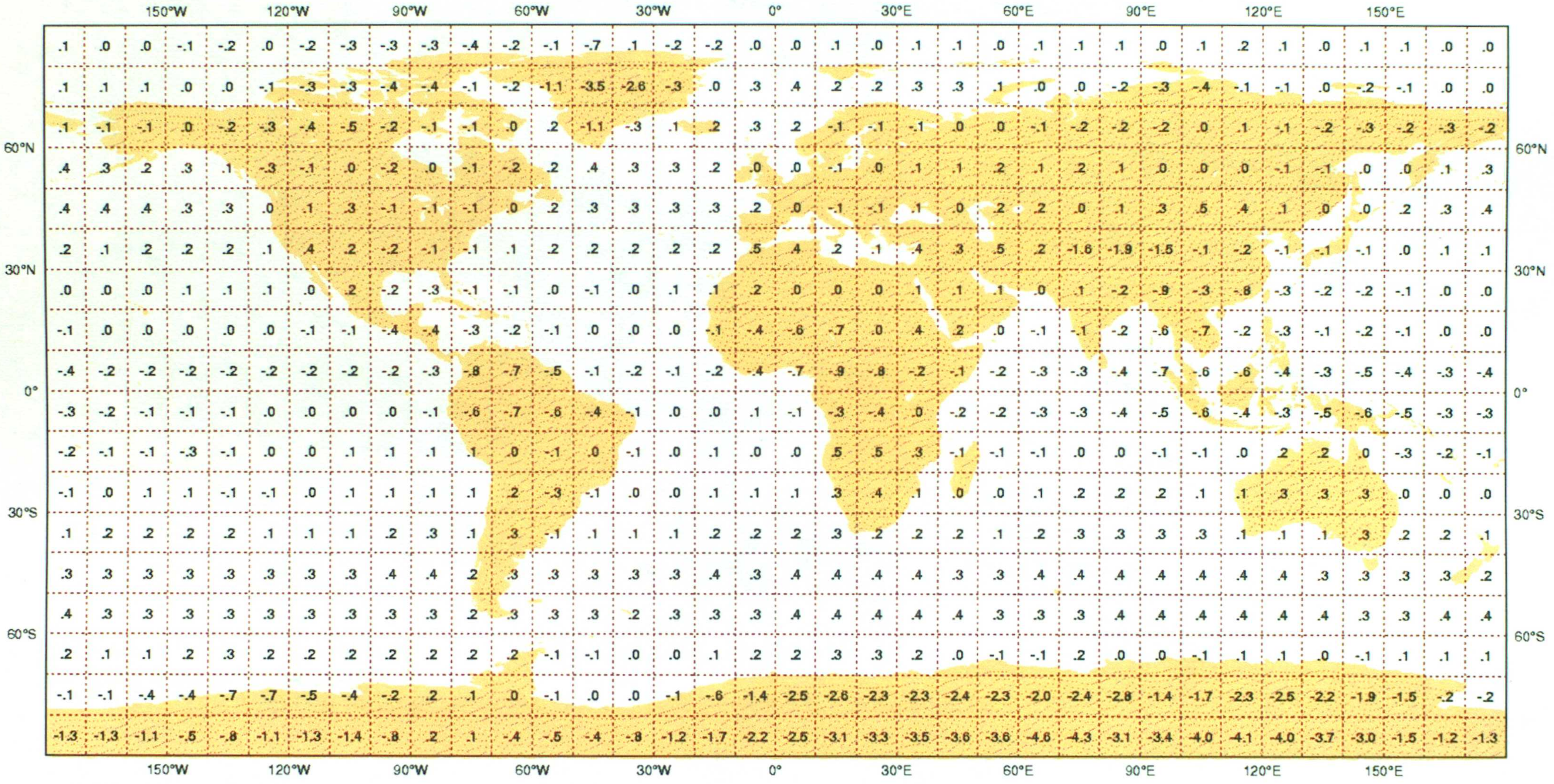
.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
.0	.0	-.1	-.1	.0	.0	.0	.1	.1	.1	.0	.0	.0	-.1	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	-.1	-.1	.0	.0	.0	.1	.1	.1
-.1	-.1	-.3	-.3	-.3	-.2	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.3	-.2	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.1	-.2	-.2	-.2	-.1	-.2	-.2	.0	.0	.0
-.2	-.2	-.2	-.2	-.3	-.5	-.5	-.4	-.5	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.4	-.3	-.4	-.4	-.3	-.4	-.3	-.4	-.4	-.3	-.3	-.4	-.5	-.4	-.4	-.3	-.2	-.1	-.1
-.6	-.5	-.4	-.4	-.5	-.6	-.9	-.9	-1.0	-.6	-.5	-.9	-1.0	-.7	-.5	-.4	-.3	-.5	-.8	-.5	-.6	-.5	-.6	-.3	-.4	-.9	-.9	-.7	-.7	-.7	-.8	-.6	-.7	-.7	-.6	-.8
-1.2	-1.0	-1.0	-.8	-.5	-.4	-.6	-1.3	-1.4	-.7	-.7	-.8	-.7	-.8	-.6	-.4	-.2	-.7	-.7	-.4	-.3	-.1	-.4	-.5	-.5	-1.2	-1.9	-1.9	-1.4	-1.1	-.9	-1.1	-1.7	-1.9	-2.0	-1.5
-.3	-.2	-.2	-.1	-.2	-.4	-.3	-.6	-.6	-.8	-.8	-1.3	-1.3	-1.6	-1.1	-.4	-.5	-.6	-.6	-.2	.0	.0	-.1	-.1	.0	-.1	-.6	-1.8	-1.4	-2.0	-1.5	-1.7	-1.3	-.9	-.6	-.3
-1.1	-1.0	-1.1	-.8	-1.3	-1.1	-.9	-1.1	-1.8	-2.5	-2.4	-1.9	-1.1	-.4	-.3	-.5	-1.0	-1.7	-1.2	-1.0	-1.0	-1.1	-.7	-.1	-.4	-1.4	-1.8	-4.1	-3.5	-1.8	-1.5	-.8	-1.1	-1.3	-.9	-1.0
-2.9	-2.1	-2.0	-2.0	-1.9	-1.8	-2.0	-1.9	-1.7	-2.8	-4.4	-4.1	-2.4	-1.3	-1.4	-1.9	-1.9	-1.9	-2.2	-2.7	-3.0	-2.4	-1.5	-2.1	-3.0	-3.3	-3.8	-5.0	-3.9	-3.4	-3.0	-2.8	-3.5	-3.5	-2.9	-3.2
-1.5	-1.4	-.6	-.2	.0	.1	.1	.1	.1	-.1	-1.7	-2.8	-2.6	-2.0	-.9	-.3	-.1	-.1	.1	-1.1	-1.5	-.7	-1.7	-1.8	-2.4	-2.2	-3.2	-3.2	-3.1	-1.8	-1.0	-1.6	-2.8	-4.4	-2.9	-2.0
-1.3	-.8	-.9	-1.7	-.6	.1	.2	.2	.2	.1	-.3	-1.1	-1.2	-1.3	-.9	-.2	.1	.1	.2	.2	.2	.2	-.4	-1.2	-1.3	-.7	-.9	-1.1	-.5	-.1	.0	.0	-.2	-1.7	-2.5	-1.5
-1.6	-1.2	-.7	-.6	-1.6	-1.5	-.7	-.2	-.1	.0	-.1	-1.0	-1.9	-1.6	-1.1	-.8	-.4	-.2	.1	.0	.1	.2	.0	-.1	.0	-.1	.0	-.1	-.8	-1.1	-.9	-.4	-.2	-.1	-1.1	-1.1
-.9	-.8	-.4	-.1	-.5	-1.4	-1.7	-1.2	-.8	-.6	-.8	-1.1	-1.8	-1.5	-1.1	-1.0	-1.1	-.7	-.4	-.4	-.5	-.3	-.1	.0	.0	-.1	.0	-.2	-.5	-.8	-.8	-.3	-.3	-.3	-.4	-.5
-.4	-.5	-.4	-.2	-.1	-.2	-.2	-.2	-.2	-.2	-.5	-.7	-.6	-.8	-.8	-.8	-.6	-.5	-.3	-.3	-.5	-.5	-.5	-.3	-.2	-.3	-.3	-.3	-.4	-.5	-.6	-.5	-.4	-.3	-.3	-.4
-.4	-.3	-.3	-.3	-.1	-.1	-.1	-.1	-.1	-.1	-.3	-.3	-.4	-.5	-.5	-.4	-.4	-.3	-.2	-.1	-.1	-.3	-.3	-.4	-.3	-.3	-.1	-.2	-.3	-.3	-.3	-.5	-.5	-.3	-.3	-.3
-.4	-.3	-.3	-.3	-.3	-.2	-.3	-.3	-.2	-.3	-.3	-.6	-.6	-.5	-.3	-.1	.0	-.1	-.1	.0	-.1	-.2	-.4	-.3	-.3	-.4	-.2	-.2	-.2	-.2	-.2	-.3	-.2	-.3	-.3	-.4
-.4	-.5	-.5	-.6	-.6	-.8	-.9	-.8	-.7	-.7	-.9	-.7	-.6	-.5	-.3	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.3	-.1	-.2	-.3	-.2	.0	.0	-.1	.0	.0	.0	-.1	-.2	-.3
-.3	-.4	-.6	-.6	-.6	-.7	-.8	-.7	-.7	-.4	-.4	-.4	-.5	-.4	-.2	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.3	-.1	-.3	-.2	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.2

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	1.0	.9	.9	.9	.9	.9	.9	1.0	1.0	1.0	.9	.9	.9	1.0	.9	.9	.9	.9	.9	.9	.9
1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	.9
1.0	1.1	1.1	1.1	1.1	1.2	1.3	1.2	1.3	1.2	1.2	1.2	1.1	1.1	1.2	1.1	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.0
1.6	1.7	1.4	1.4	1.4	1.4	1.6	1.8	2.2	1.6	1.3	1.8	1.9	1.5	1.4	1.3	1.1	1.4	1.6	1.4	1.6	1.6	1.7	1.3	1.5	1.8	1.8	1.6	1.6	1.7	1.6	1.4	1.5	1.6	1.5	1.8
1.9	1.9	1.9	1.7	1.5	1.3	1.7	2.4	2.6	1.8	1.9	1.9	1.9	2.0	1.7	1.4	1.2	1.7	1.9	1.6	1.6	1.3	1.6	1.6	1.7	2.1	2.5	2.6	2.3	2.1	1.8	1.9	2.4	2.6	2.6	2.1
1.4	1.3	1.2	1.2	1.3	1.6	1.5	1.9	2.1	2.6	2.3	2.8	2.6	2.6	2.2	1.5	1.8	1.9	1.9	1.4	1.1	1.0	1.3	1.4	1.3	1.2	2.2	3.7	3.2	3.5	2.8	3.0	2.7	2.2	1.9	1.5
2.7	2.5	2.6	2.3	2.9	2.8	2.6	3.0	3.6	3.9	4.0	3.6	2.6	1.7	1.5	1.8	2.7	3.4	2.8	2.6	2.7	2.9	2.7	1.5	2.0	3.3	3.6	5.2	4.9	3.5	3.3	2.4	2.8	2.7	2.3	2.3
4.4	3.8	3.8	4.0	4.1	4.0	3.9	4.1	3.9	4.6	5.4	4.9	4.0	3.1	3.3	3.8	3.9	3.8	4.2	4.6	4.8	4.3	3.5	4.1	4.8	4.9	5.2	5.4	4.8	4.4	4.4	4.4	4.9	4.9	4.5	4.7
3.6	3.5	2.5	1.9	1.6	1.2	1.2	1.4	1.2	1.4	3.6	4.3	4.1	3.6	2.4	1.8	1.7	1.6	1.3	3.5	3.7	2.6	3.7	3.7	4.3	4.1	5.0	4.8	4.7	3.6	2.8	3.7	4.3	5.5	4.5	3.8
3.3	2.9	2.7	3.5	2.3	1.2	1.0	.9	1.0	1.0	1.8	2.7	2.9	2.9	2.4	1.5	1.2	1.3	1.1	1.2	1.1	1.1	1.9	2.7	3.0	2.6	2.7	2.7	2.0	1.5	1.3	1.2	1.6	3.5	3.7	3.2
3.0	2.7	2.1	2.0	3.0	2.9	2.0	1.5	1.5	1.2	1.2	2.8	3.9	3.3	2.7	2.4	1.9	1.5	1.0	1.2	1.1	1.0	1.3	1.3	1.3	1.5	1.3	1.5	2.2	2.4	2.1	1.6	1.4	1.4	2.5	2.2
2.1	2.2	1.7	1.3	1.9	2.6	2.5	2.2	2.0	1.8	1.9	2.4	3.5	2.7	2.5	2.5	2.6	2.2	1.6	1.5	1.8	1.6	1.3	1.3	1.4	1.4	1.3	1.4	1.7	2.0	1.9	1.5	1.5	1.4	1.6	1.8
1.6	1.7	1.6	1.4	1.3	1.4	1.5	1.4	1.3	1.5	1.6	1.9	1.8	1.9	2.0	2.1	1.7	1.6	1.4	1.3	1.6	1.5	1.6	1.5	1.4	1.5	1.5	1.4	1.4	1.5	1.7	1.6	1.5	1.4	1.4	1.5
1.4	1.3	1.4	1.3	1.2	1.1	1.2	1.3	1.3	1.3	1.4	1.5	1.6	1.7	1.7	1.7	1.6	1.5	1.4	1.2	1.3	1.4	1.5	1.7	1.6	1.5	1.3	1.3	1.3	1.4	1.4	1.6	1.7	1.5	1.3	1.4
1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.7	1.8	1.7	1.5	1.3	1.2	1.3	1.3	1.2	1.2	1.3	1.5	1.5	1.6	1.6	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.4	1.4	1.7
1.6	1.6	1.7	1.7	1.6	1.8	1.9	1.7	1.7	1.8	1.8	1.8	1.7	1.6	1.5	1.3	1.2	1.2	1.2	1.2	1.3	1.3	1.5	1.3	1.4	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.5	1.6
1.5	1.6	1.8	1.8	1.7	1.8	1.7	1.6	1.6	1.5	1.4	1.4	1.5	1.5	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



.1	.0	.0	-.1	-.2	.0	-.2	-.3	-.3	-.3	-.4	-.2	-.1	-.7	.1	-.2	-.2	.0	.0	.1	.0	.1	.1	.0	.1	.1	.1	.0	.1	.2	.1	.0	.1	.1	.0	.0
.1	.1	.1	.0	.0	-.1	-.3	-.3	-.4	-.4	-.1	-.2	-1.1	-3.5	-2.6	-.3	.0	.3	.4	.2	.2	.3	.3	.1	.0	.0	-.2	-.3	-.4	-.1	-.1	.0	-.2	-.1	.0	.0
.1	-.1	-.1	.0	-.2	-.3	-.4	-.5	-.2	-.1	-.1	.0	.2	-1.1	-.3	.1	.2	.3	.2	-.1	-.1	-.1	.0	.0	-.1	-.2	-.2	-.2	.0	.1	-.1	-.2	-.3	-.2	-.3	-.2
.4	.3	.2	.3	.1	-.3	-.1	.0	-.2	.0	-.1	-.2	.2	.4	.3	.3	.2	.0	.0	-.1	.0	.1	.1	.2	.1	.2	.1	.0	.0	.0	-.1	-.1	.0	.0	.1	.3
.4	.4	.4	.3	.3	.0	.1	.3	-.1	-.1	-.1	.0	.2	.3	.3	.3	.3	.2	.0	-.1	-.1	.1	.0	.2	.2	.0	.1	.3	.5	.4	.1	.0	.0	.2	.3	.4
.2	.1	.2	.2	.2	.1	.4	.2	-.2	-.1	-.1	.1	.2	.2	.2	.2	.2	.5	.4	.2	.1	.4	.3	.5	.2	-1.6	-1.9	-1.5	-.1	-.2	-.1	-.1	-.1	.0	.1	.1
.0	.0	.0	.1	.1	.1	.0	.2	-.2	-.3	-.1	-.1	.0	-.1	.0	.1	.1	.2	.0	.0	.0	.1	.1	.1	.0	.1	-.2	-.9	-.3	-.8	-.3	-.2	-.2	-.1	.0	.0
-.1	.0	.0	.0	.0	.0	-.1	-.1	-.4	-.4	-.3	-.2	-.1	.0	.0	.0	-.1	-.4	-.6	-.7	.0	.4	.2	.0	-.1	-.1	-.2	-.6	-.7	-.2	-.3	-.1	-.2	-.1	.0	.0
-.4	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.3	-.8	-.7	-.5	-.1	-.2	-.1	-.2	-.4	-.7	-.9	-.8	-.2	-.1	-.2	-.3	-.3	-.4	-.7	-.6	-.6	-.4	-.3	-.5	-.4	-.3	-.4
-.3	-.2	-.1	-.1	-.1	.0	.0	.0	.0	-.1	-.6	-.7	-.6	-.4	-.1	.0	.0	.1	-.1	-.3	-.4	.0	-.2	-.2	-.3	-.3	-.4	-.5	-.6	-.4	-.3	-.5	-.6	-.5	-.3	-.3
-.2	-.1	-.1	-.3	-.1	.0	.0	.1	.1	.1	.1	.0	-.1	.0	-.1	.0	.1	.0	.0	.5	.5	.3	-.1	-.1	-.1	.0	.0	-.1	-.1	.0	.2	.2	.0	-.3	-.2	-.1
-.1	.0	.1	.1	-.1	-.1	.0	.1	.1	.1	.1	.2	-.3	-.1	.0	.0	.1	.1	.1	.3	.4	.1	.0	.0	.1	.2	.2	.2	.1	.1	.3	.3	.3	.0	.0	.0
.1	.2	.2	.2	.2	.1	.1	.1	.2	.3	.1	.3	-.1	.1	.1	.1	.2	.2	.2	.3	.2	.2	.2	.1	.2	.3	.3	.3	.3	.1	.1	.1	.3	.2	.2	.1
.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.2	.3	.3	.3	.3	.3	.4	.3	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.2
.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.3	.3	.2	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4
.2	.1	.1	.2	.3	.2	.2	.2	.2	.2	.2	.2	-.1	-.1	.0	.0	.1	.2	.2	.3	.3	.2	.0	-.1	-.1	.2	.0	.0	-.1	.1	.1	.0	-.1	.1	.1	.1
-.1	-.1	-.4	-.4	-.7	-.7	-.5	-.4	-.2	.2	.1	.0	-.1	.0	.0	-.1	-.6	-1.4	-2.5	-2.6	-2.3	-2.3	-2.4	-2.3	-2.0	-2.4	-2.8	-1.4	-1.7	-2.3	-2.5	-2.2	-1.9	-1.5	-.2	-.2
-1.3	-1.3	-1.1	-.5	-.8	-1.1	-1.3	-1.4	-.8	.2	.1	-.4	-.5	-.4	-.8	-1.2	-1.7	-2.2	-2.5	-3.1	-3.3	-3.5	-3.6	-3.6	-4.6	-4.3	-3.1	-3.4	-4.0	-4.1	-4.0	-3.7	-3.0	-1.5	-1.2	-1.3

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

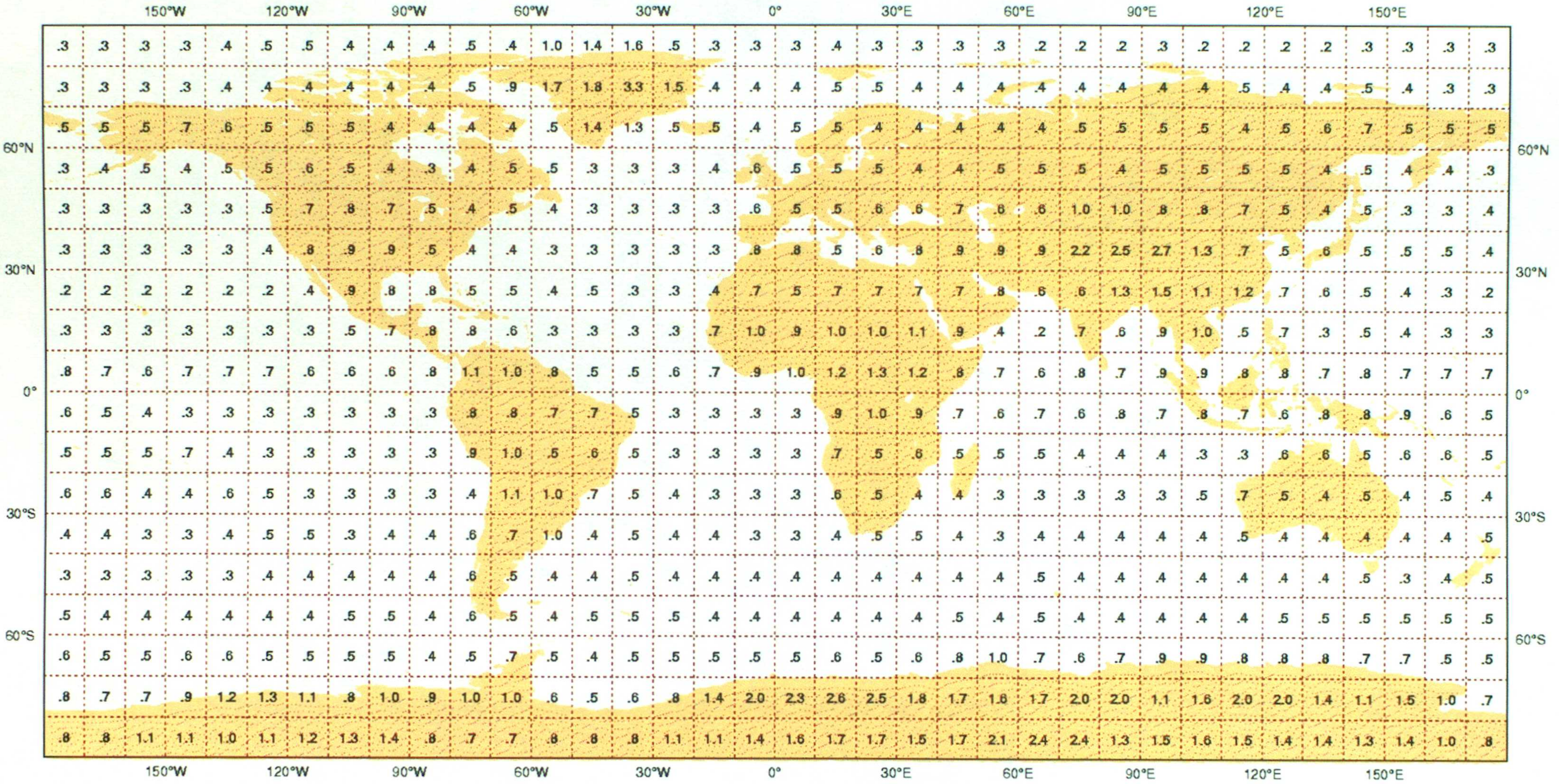
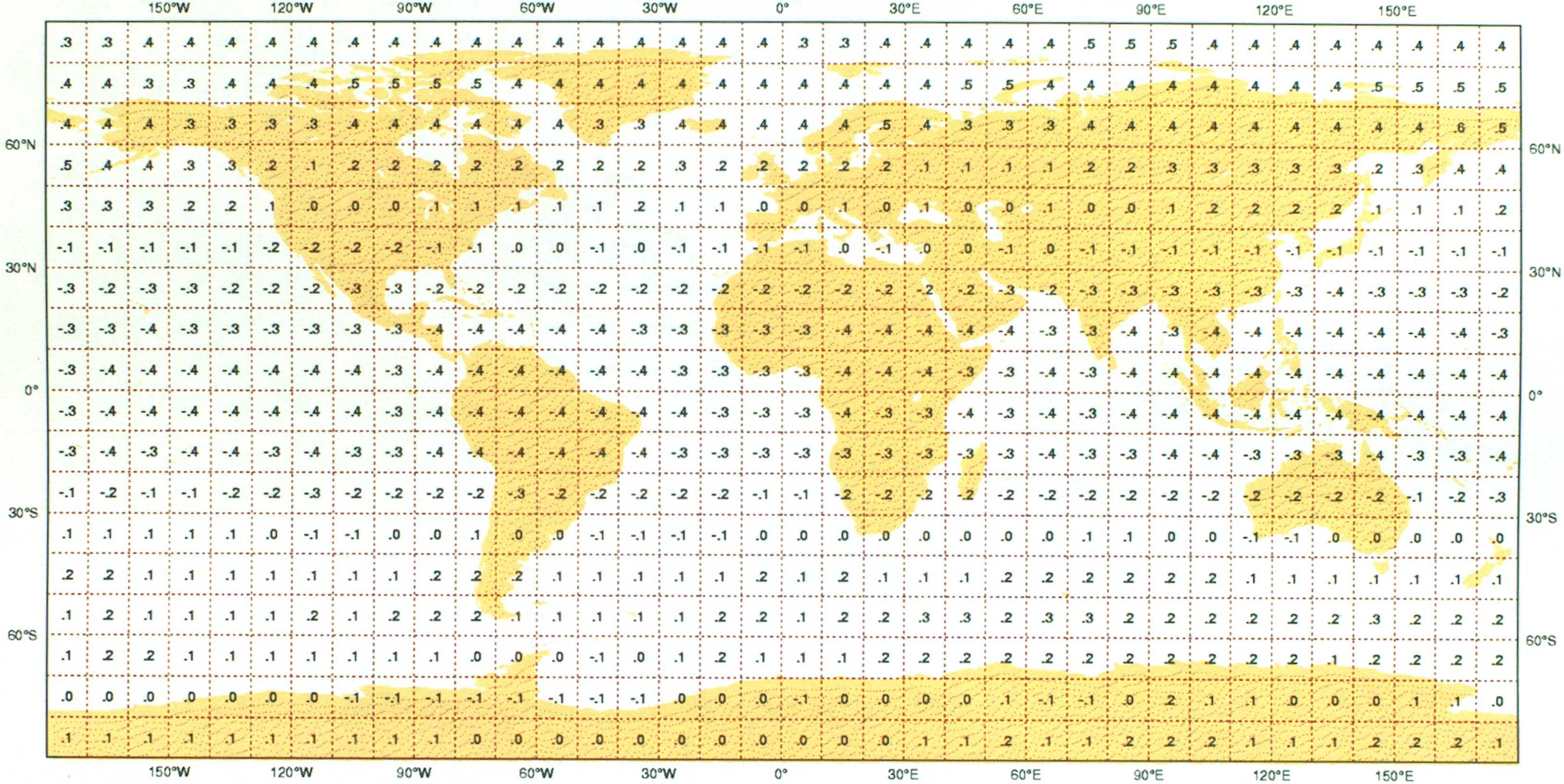

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.3 .3 .3 .3 .4 .5 .5 .4 .4 .4 .5 .4 1.0 1.4 1.6 .5 .3 .3 .3 .4 .3 .3 .3 .3 .2 .2 .2 .3 .2 .2 .2 .2 .3 .3 .3 .3
.3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .5 .9 1.7 1.8 3.3 1.5 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .5 .4 .3 .3
.5 .5 .5 .7 .6 .5 .5 .5 .4 .4 .4 .4 .5 1.4 1.3 .5 .5 .4 .5 .5 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .5 .6 .7 .5 .5 .5
.3 .4 .5 .4 .5 .5 .6 .5 .4 .3 .4 .5 .5 .3 .3 .3 .4 .6 .5 .5 .5 .4 .4 .5 .5 .5 .4 .5 .5 .5 .5 .4 .5 .4 .4 .3
.3 .3 .3 .3 .3 .5 .7 .8 .7 .5 .4 .5 .4 .3 .3 .3 .3 .6 .5 .5 .6 .6 .7 .6 .6 1.0 1.0 .8 .8 .7 .5 .4 .5 .3 .3 .4
.3 .3 .3 .3 .3 .4 .8 .9 .9 .5 .4 .4 .3 .3 .3 .3 .3 .8 .8 .5 .6 .8 .9 .9 .9 2.2 2.5 2.7 1.3 .7 .5 .6 .5 .5 .5 .4
.2 .2 .2 .2 .2 .2 .4 .9 .8 .8 .5 .5 .4 .5 .3 .3 .4 .7 .5 .7 .7 .7 .7 .8 .6 .6 1.3 1.5 1.1 1.2 .7 .6 .5 .4 .3 .2
.3 .3 .3 .3 .3 .3 .3 .5 .7 .8 .8 .6 .3 .3 .3 .3 .7 1.0 .9 1.0 1.0 1.1 .9 .4 .2 .7 .6 .9 1.0 .5 .7 .3 .5 .4 .3 .3
.8 .7 .6 .7 .7 .7 .6 .6 .6 .8 1.1 1.0 .8 .5 .5 .6 .7 .9 1.0 1.2 1.3 1.2 .8 .7 .6 .8 .7 .9 .9 .8 .8 .7 .8 .7 .7 .7
.6 .5 .4 .3 .3 .3 .3 .3 .3 .3 .8 .8 .7 .7 .5 .3 .3 .3 .3 .9 1.0 .9 .7 .6 .7 .6 .8 .7 .8 .7 .6 .8 .8 .9 .6 .5
.5 .5 .5 .7 .4 .3 .3 .3 .3 .3 .9 1.0 .5 .6 .5 .3 .3 .3 .3 .7 .5 .6 .5 .5 .5 .4 .4 .4 .3 .3 .6 .6 .5 .6 .6 .5
.6 .6 .4 .4 .6 .5 .3 .3 .3 .3 .4 1.1 1.0 .7 .5 .4 .3 .3 .3 .6 .5 .4 .4 .3 .3 .3 .3 .3 .5 .7 .5 .4 .5 .4 .5 .4
.4 .4 .3 .3 .4 .5 .5 .3 .4 .4 .6 .7 1.0 .4 .5 .4 .4 .3 .3 .4 .5 .5 .4 .3 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .5
.3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .6 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .3 .4 .5
.5 .4 .4 .4 .4 .4 .4 .5 .5 .4 .6 .5 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5
.6 .5 .5 .6 .6 .5 .5 .5 .5 .4 .5 .7 .5 .4 .5 .5 .5 .5 .5 .6 .5 .6 .8 1.0 .7 .6 .7 .9 .9 .8 .8 .8 .7 .7 .5 .5
.8 .7 .7 .9 1.2 1.3 1.1 .8 1.0 .9 1.0 1.0 .6 .5 .6 .8 1.4 2.0 2.3 2.6 2.5 1.8 1.7 1.6 1.7 2.0 2.0 1.1 1.6 2.0 2.0 1.4 1.1 1.5 1.0 .7
.8 .8 1.1 1.1 1.0 1.1 1.2 1.3 1.4 .8 .7 .7 .8 .8 .8 1.1 1.1 1.4 1.6 1.7 1.7 1.5 1.7 2.1 2.4 2.4 1.3 1.5 1.6 1.5 1.4 1.4 1.3 1.4 1.0 .8

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.3	.3	.4	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5
.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.5	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.6	.5
.5	.4	.4	.3	.3	.2	.1	.2	.2	.2	.2	.2	.2	.2	.2	.3	.2	.2	.2	.2	.2	.1	.1	.1	.1	.2	.2	.3	.3	.3	.3	.3	.2	.3	.4	.4
.3	.3	.3	.2	.2	.1	.0	.0	.0	.1	.1	.1	.1	.1	.2	.1	.1	.0	.0	.1	.0	.1	.0	.0	.1	.0	.0	.1	.2	.2	.2	.2	.1	.1	.1	.2
-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.1	-.1	.0	.0	-.1	.0	-.1	-.1	-.1	-.1	.0	-.1	.0	.0	-.1	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1
-.3	-.2	-.3	-.3	-.2	-.2	-.2	-.3	-.3	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.3	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.3	-.3	-.3	-.2
-.3	-.3	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.4	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3
-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.3	-.3	-.4	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4
-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.4	-.3	-.3	-.4	-.3	-.4	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4
-.3	-.4	-.3	-.4	-.4	-.3	-.4	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.3	-.3	-.4	-.4	-.3	-.3	-.3	-.4	-.3	-.3	-.4
-.1	-.2	-.1	-.1	-.2	-.2	-.3	-.2	-.2	-.2	-.2	-.3	-.2	-.2	-.2	-.2	-.2	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.1	-.2	-.3
.1	.1	.1	.1	.1	.0	-.1	-.1	.0	.0	.1	.0	.0	-.1	-.1	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.0	.0	-.1	-.1	.0	.0	.0	.0	.0
.2	.2	.1	.1	.1	.1	.1	.1	.1	.2	.2	.2	.1	.1	.1	.1	.1	.2	.1	.2	.1	.1	.1	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1
.1	.2	.1	.1	.1	.1	.2	.1	.2	.2	.2	.1	.1	.1	.1	.1	.2	.2	.1	.2	.2	.3	.3	.2	.3	.3	.2	.2	.2	.2	.2	.2	.3	.2	.2	.2
.1	.2	.2	.1	.1	.1	.1	.1	.1	.1	.0	.0	.0	-.1	.0	.1	.2	.1	.1	.1	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.1	.2	.2	.2	.2
.0	.0	.0	.0	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	.0	.0	.0	-.1	.0	.0	.0	.0	.1	-.1	-.1	.0	.2	.1	.1	.0	.0	.0	.1	.1	.0
.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.1	.1	.2	.2	.2	.1	.1	.1	.2	.2	.2	.1

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

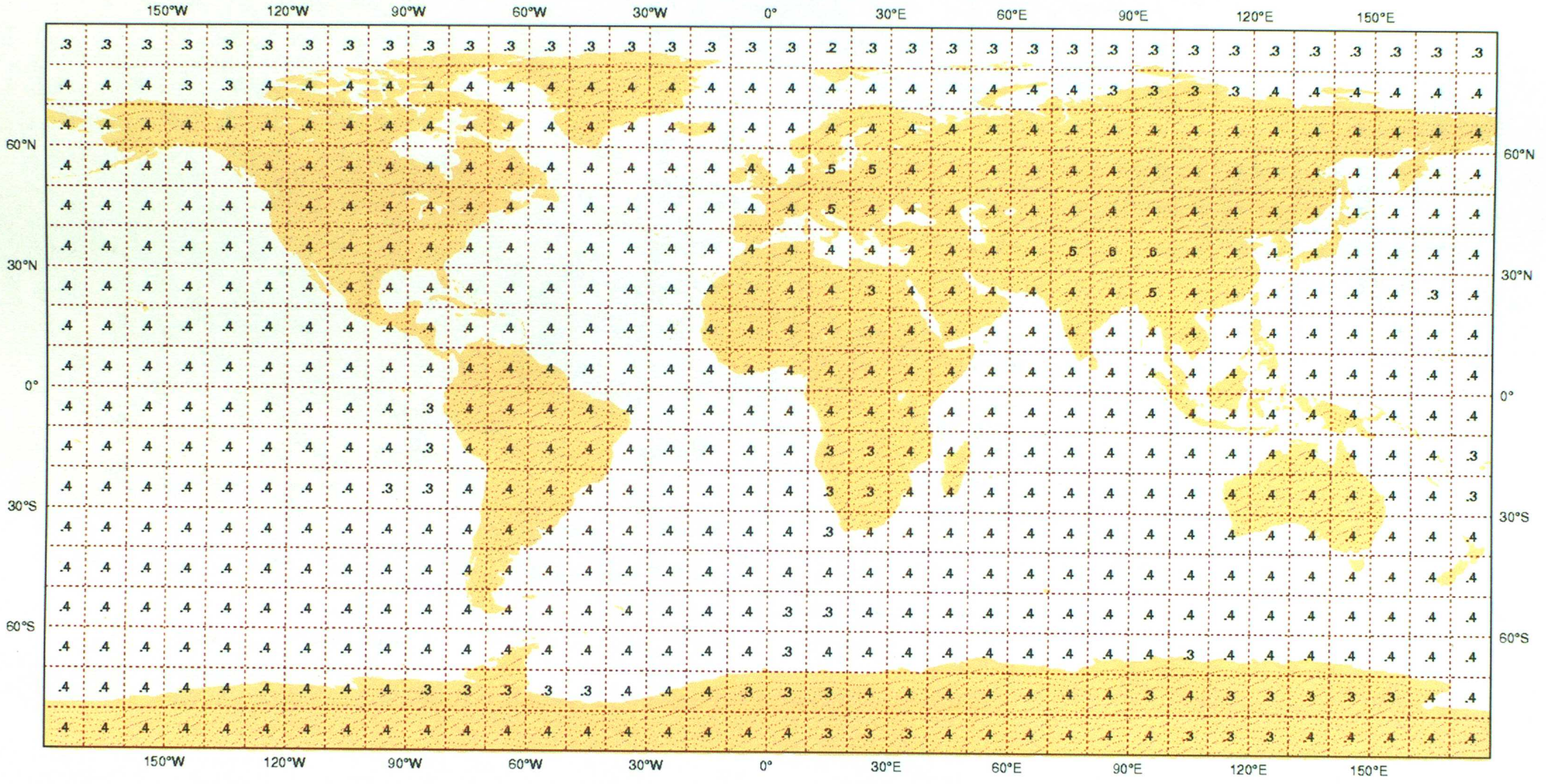
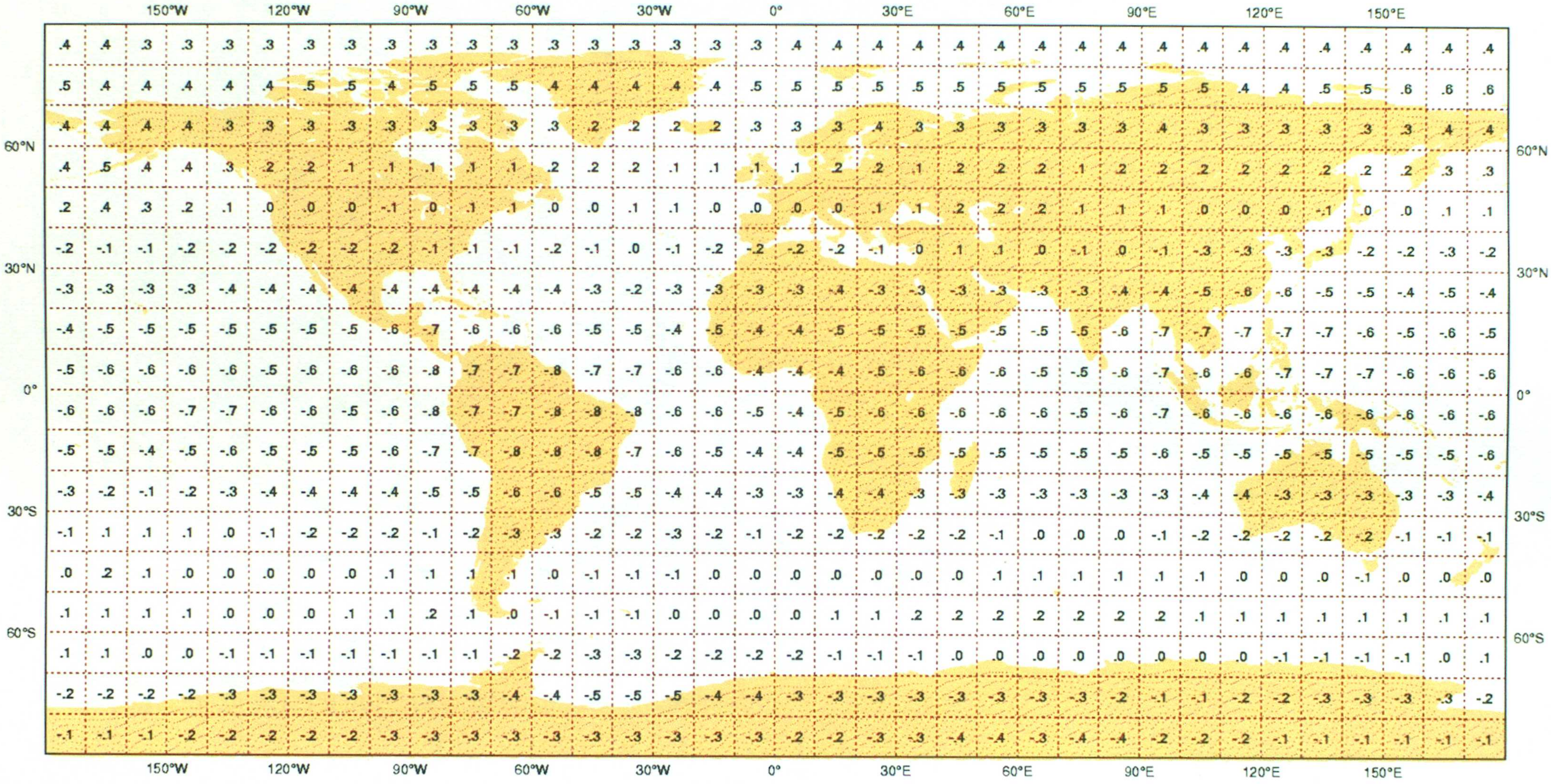

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .6 .6 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .3 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4
60°N
30°N
0°
30°S
60°S
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.5	.4	.4	.4	.4	.4	.5	.5	.4	.5	.5	.5	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.5	.5	.6	.6	.6
.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.2	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.4	.4
.4	.5	.4	.4	.3	.2	.2	.1	.1	.1	.1	.1	.2	.2	.2	.1	.1	.1	.1	.2	.2	.1	.2	.2	.2	.1	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3
.2	.4	.3	.2	.1	.0	.0	.0	-.1	.0	.1	.1	.0	.0	.1	.1	.0	.0	.0	.0	.1	.1	.2	.2	.2	.1	.1	.1	.0	.0	.0	-.1	.0	.0	.1	.1
-.2	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.1	-.1	-.1	-.2	-.1	.0	-.1	-.2	-.2	-.2	-.2	-.1	.0	.1	.1	.0	-.1	.0	-.1	-.3	-.3	-.3	-.3	-.2	-.2	-.3	-.2
-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.2	-.3	-.3	-.3	-.3	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.5	-.6	-.6	-.5	-.5	-.4	-.5	-.4
-.4	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6	-.7	-.6	-.6	-.6	-.5	-.5	-.4	-.5	-.4	-.4	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6	-.7	-.7	-.7	-.7	-.7	-.6	-.5	-.6	-.5
-.5	-.6	-.6	-.6	-.6	-.5	-.6	-.6	-.6	-.8	-.7	-.7	-.8	-.7	-.7	-.6	-.6	-.4	-.4	-.4	-.5	-.6	-.6	-.6	-.5	-.5	-.6	-.7	-.6	-.6	-.7	-.7	-.7	-.6	-.6	-.6
-.6	-.6	-.6	-.7	-.7	-.6	-.6	-.5	-.6	-.8	-.7	-.7	-.8	-.8	-.8	-.6	-.6	-.5	-.4	-.5	-.6	-.6	-.6	-.6	-.6	-.5	-.6	-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.6	-.6
-.5	-.5	-.4	-.5	-.6	-.5	-.5	-.5	-.6	-.7	-.7	-.8	-.8	-.8	-.7	-.6	-.5	-.4	-.4	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6
-.3	-.2	-.1	-.2	-.3	-.4	-.4	-.4	-.4	-.5	-.5	-.6	-.6	-.5	-.5	-.4	-.4	-.3	-.3	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.4
-.1	.1	.1	.1	.0	-.1	-.2	-.2	-.2	-.1	-.2	-.3	-.3	-.2	-.2	-.3	-.2	-.1	-.2	-.2	-.2	-.2	-.2	-.1	.0	.0	.0	-.1	-.2	-.2	-.2	-.2	-.2	-.1	-.1	-.1
.0	.2	.1	.0	.0	.0	.0	.0	.1	.1	.1	.1	.0	-.1	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.0	.0	.0	-.1	.0	.0	.0
.1	.1	.1	.1	.0	.0	.0	.1	.1	.2	.1	.0	-.1	-.1	-.1	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1
.1	.1	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.3	-.3	-.2	-.2	-.2	-.2	-.1	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	.0	-.1	-.1	-.1	-.1	.0	.1
-.2	-.2	-.2	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.5	-.5	-.5	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.1	-.1	-.2	-.2	-.3	-.3	-.3	-.3	-.2
-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.3	-.2	-.2	-.3	-.3	-.4	-.4	-.3	-.4	-.4	-.2	-.2	-.2	-.1	-.1	-.1	-.1	-.1	-.1

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). MAY 2005
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

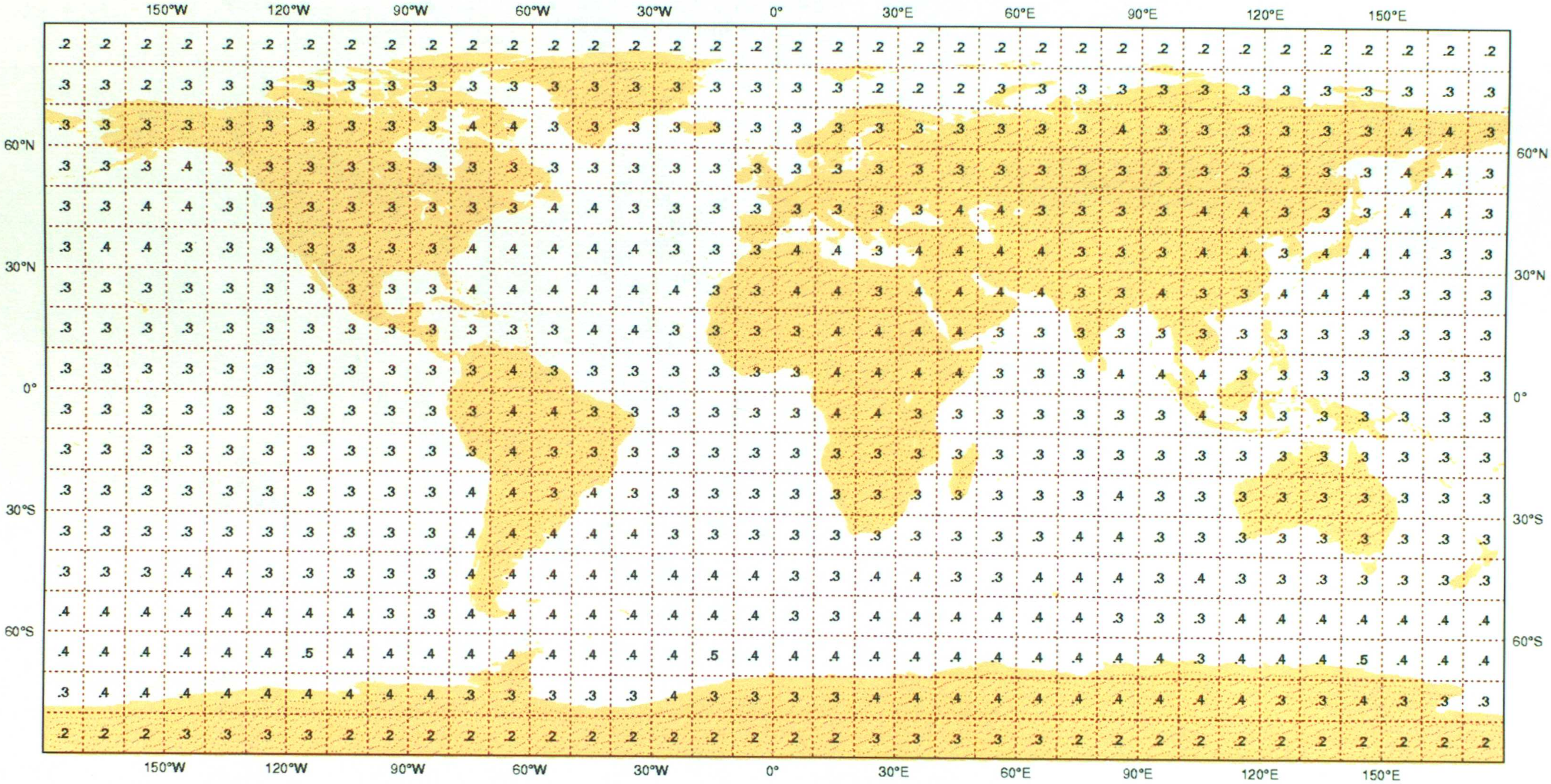

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the wind observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13534	37.4	-28.1	P	722	0	0	0.8	-0.3	0.9
41539	26.2	-70.6	P	868	0	16	0.5	1.3	1.4
41540	41.3	-44.4	P	737	0	13	0.9	0.9	1.3
41542	26.1	-70.0	P	835	0	15	0.6	0.3	0.6
41543	26.1	-63.9	P	835	0	13	0.6	0.0	0.6
41544	20.2	-59.8	P	819	0	13	0.5	0.4	0.7
41545	26.1	-70.3	P	859	0	16	0.5	0.6	0.8
41546	19.9	-79.8	P	801	0	55	0.7	0.9	1.1
41663	17.3	-62.7	P	1613	0	100	1.1	-1.2	1.7
41921	26.2	-75.2	P	305	1	100	3.2	7.8	8.4
41924	24.2	-73.7	P	326	5	95	3.2	7.9	8.5
41925	21.2	-73.4	P	317	5	41	5.1	2.3	5.6
41927	26.7	-71.5	P	580	0	34	0.7	-0.3	0.8
41929	29.7	-69.1	P	706	0	41	0.7	0.4	0.8
41931	34.8	-70.8	P	504	1	28	1.0	0.1	1.0
41934	24.2	-70.4	P	699	1	39	0.8	-0.6	1.0
41935	28.6	-70.3	P	604	0	34	0.9	-0.4	1.0
41939	35.8	-53.8	P	673	0	100	1.0	-2.6	2.8
44549	51.8	-31.7	P	621	0	2	0.4	0.1	0.4
44550	48.4	-32.5	P	630	0	1	0.6	0.1	0.6
44601	50.0	-41.1	P	194	0	6	2.5	0.1	2.5
44607	40.3	-41.1	P	734	0	1	0.5	-0.1	0.5
44608	39.1	-41.6	P	1011	0	31	0.5	-0.2	0.5
44609	48.1	-36.4	P	638	0	0	0.5	-0.1	0.5
44610	54.2	-37.5	P	714	0	1	0.6	-0.2	0.7
44611	52.3	-35.3	P	701	0	0	0.5	-0.1	0.5
44612	60.9	-16.9	P	633	0	1	0.5	0.1	0.5
44615	45.3	-50.4	P	721	0	0	0.6	0.0	0.6
44627	42.0	-24.7	P	619	0	3	0.5	-0.3	0.6
44628	29.9	-26.2	P	665	0	1	0.4	-0.1	0.5
44635	43.1	-53.2	P	352	0	14	0.8	0.6	1.0
44722	47.5	-34.9	P	686	0	1	0.6	-0.1	0.7
44723	62.9	-33.8	P	717	0	1	0.6	0.0	0.6
44725	55.2	-45.8	P	718	0	1	0.7	0.3	0.8
44726	49.1	-47.2	P	710	0	1	0.8	-0.2	0.9
44727	46.6	-34.7	P	716	0	1	0.5	0.2	0.5
44728	48.9	-38.9	P	720	0	2	0.5	0.3	0.6
44729	46.3	-54.2	P	728	0	1	0.7	-0.7	1.0
44743	42.6	-12.5	P	603	0	1	0.5	0.0	0.6
44745	47.8	-5.9	P	712	0	0	0.4	-0.2	0.5
44775	55.6	-23.8	P	715	0	51	0.4	-0.1	0.4
44777	23.9	-54.4	P	532	0	35	0.6	0.1	0.6
44778	33.8	-28.7	P	371	0	38	0.6	0.1	0.6
44842	58.9	-29.1	P	920	0	20	0.5	-0.1	0.5
44843	62.9	-24.9	P	930	0	21	0.5	-0.1	0.5
44844	55.3	-37.2	P	912	0	19	0.4	0.0	0.4
44845	44.6	-49.2	P	963	0	39	0.7	0.0	0.7
44846	44.1	-39.1	P	1161	0	37	0.5	-0.1	0.5
44847	40.7	-42.1	P	1145	0	36	0.5	-0.1	0.5
44848	41.3	-42.5	P	1064	0	32	0.5	0.0	0.5
62501	44.4	-5.4	P	627	0	1	0.4	0.2	0.5
62502	46.8	-5.9	P	662	0	11	0.4	0.2	0.4
62503	45.8	-5.8	P	595	0	0	0.4	0.1	0.4
62510	38.2	-22.4	P	737	0	3	0.6	0.3	0.7
62511	47.1	-13.2	P	607	0	0	0.5	0.4	0.6
62512	41.6	-16.8	P	386	0	2	1.6	1.5	2.2

62513	49.0	-25.3	P	723	0	0	0.6	0.1	0.6
62514	63.2	-26.5	P	708	0	1	0.5	-0.1	0.5
62556	33.9	-19.2	P	667	0	1	0.4	-0.1	0.4
62557	30.7	-17.2	P	691	0	0	0.4	0.0	0.4

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
62560	45.3	-14.8	P	711	0	13	0.9	0.5	1.0
62562	51.4	-16.9	P	651	0	6	0.7	0.7	1.0
62563	54.8	-10.6	P	690	0	1	0.5	-0.1	0.5
62564	44.1	-23.8	P	721	0	3	0.7	0.5	0.9
62566	58.7	-18.7	P	691	0	0	0.5	0.0	0.5
62567	47.7	-13.6	P	644	0	1	0.5	-0.3	0.6
62901	49.1	-26.6	P	916	0	20	0.5	-0.1	0.5
62907	46.5	-5.6	P	162	0	6	0.5	0.0	0.5
62908	46.3	-4.4	P	165	0	7	0.6	0.2	0.6
62909	46.8	-5.9	P	96	0	5	0.4	-0.1	0.4
62910	44.7	-4.1	P	137	0	4	0.5	-0.1	0.5
62926	45.0	-5.4	P	186	0	5	0.4	-0.1	0.4
62927	46.1	-6.0	P	45	0	4	0.3	-0.1	0.4
62928	46.8	-5.9	P	150	0	9	0.4	-0.1	0.4
62929	45.3	-5.2	P	117	0	3	0.5	-0.1	0.5
62930	44.5	-5.9	P	161	0	4	0.5	-0.1	0.5
62931	44.4	-6.5	P	295	0	11	0.4	-0.3	0.5
62932	46.2	-6.1	P	161	0	10	1.1	-0.2	1.1
62934	49.0	-20.8	P	1125	0	37	0.6	0.0	0.6
62935	46.5	-6.0	P	6	0	0	0.2	0.1	0.2
62936	46.5	-6.1	P	7	0	14	0.2	0.1	0.2
62937	45.5	-5.8	P	7	0	0	0.2	0.0	0.2
64609	62.5	-36.3	P	716	0	1	0.6	0.0	0.6
64610	63.4	-1.5	P	630	0	0	0.5	0.0	0.5
64611	65.2	-32.1	P	289	0	0	0.7	-0.6	0.9
64612	60.4	-21.5	P	721	0	1	0.4	-0.8	0.9

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41539	26.2	-70.6	SPEED	631	0	100	1.6	-4.6	4.9
41542	26.1	-70.0	SPEED	806	0	100	1.9	-0.2	1.9
41543	26.1	-63.9	SPEED	804	0	100	1.1	-1.7	2.1
41544	20.2	-59.8	SPEED	802	0	100	1.5	-1.4	2.0
41545	26.1	-70.3	SPEED	837	0	100	1.5	-2.1	2.6
41921	26.2	-75.2	SPEED	270	0	100	2.8	-4.7	5.5
41924	24.2	-73.7	SPEED	18	28	100	6.0	3.0	6.7
41925	21.2	-73.4	SPEED	306	1	100	3.3	-4.7	5.7
41927	26.7	-71.5	SPEED	3	100	0			
41929	29.7	-69.1	SPEED	86	1	100	2.3	1.2	2.6
41931	34.8	-70.8	SPEED	14	50	100	6.1	9.9	11.6
41934	24.2	-70.4	SPEED	9	44	100	7.8	9.2	12.0
41935	28.6	-70.3	SPEED	2	50	100	0.0	18.8	18.8
41939	35.8	-53.8	SPEED	8	50	100	6.2	4.3	7.5
62511	47.1	-13.2	SPEED	492	0	100	2.0	2.2	3.0
62566	58.7	-18.7	SPEED	557	0	100	2.0	0.5	2.0

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41539	26.2	-70.6	DIRN.	1	0	0	0.0	-15.8	15.8
41542	26.1	-70.0	DIRN.	365	0	0	22.8	16.4	28.1
41543	26.1	-63.9	DIRN.	149	0	0	16.0	-1.9	16.1
41544	20.2	-59.8	DIRN.	270	0	0	22.5	7.5	23.7
41545	26.1	-70.3	DIRN.	169	0	0	18.1	-8.2	19.8
41921	26.2	-75.2	DIRN.	7	14	0	79.1	15.4	80.5

41924	24.2	-73.7	DIRN.	11	45	0	65.3	-15.4	67.1
41925	21.2	-73.4	DIRN.	9	33	0	67.3	-25.0	71.7
41927	26.7	-71.5	DIRN.	3	100	0			
41929	29.7	-69.1	DIRN.	6	17	0	18.7	11.2	21.8
41931	34.8	-70.8	DIRN.	12	58	0	48.3	-41.4	63.6
41934	24.2	-70.4	DIRN.	6	67	0	47.1	-55.8	73.0
41935	28.6	-70.3	DIRN.	1	100	0			
41939	35.8	-53.8	DIRN.	6	67	0	24.8	17.4	30.2
62511	47.1	-13.2	DIRN.	371	0	0	13.4	10.6	17.0
62566	58.7	-18.7	DIRN.	437	0	0	18.5	-7.1	19.8

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	755	1	6	1.5	0.0	440	0	6	0	6.7	0.6
ABD	28	0	11	1.4	-0.3	22	0	9	0	7.9	0.2
ACA	992	1	4	1.6	-0.2	527	0	2	0	5.4	0.9
ACF	33	15	45	3.0	0.0	20	0	65	0	16.3	1.3
AEA	430	0	3	1.4	0.1	352	1	3	0	6.0	0.2
AFL	461	0	3	1.5	0.2	259	0	4	0	7.9	0.8
AFR	543	1	9	1.6	0.2	499	0	7	0	7.7	-0.1
AJM	133	0	8	1.9	-0.5	83	0	6	0	9.4	-0.4
AME	22	0	9	2.0	-1.3	22	0	14	0	9.9	2.9
AMT	93	0	6	1.3	0.2	84	0	6	0	4.8	-0.1
AMX	338	1	3	1.6	0.1	255	1	59	0	9.3	0.5
AVA	26	0	0	1.6	0.3	26	0	0	0	5.5	-0.2
AZA	236	0	8	1.9	0.0	181	0	8	0	8.0	0.4
BAF	34	0	3	1.3	-0.6	26	0	8	0	9.8	-0.4
BAL	179	0	9	1.4	-0.2	176	0	11	0	6.6	0.2
BAW	360	1	20	2.0	-0.6	174	0	19	0	6.5	0.2
BMA	68	0	3	1.6	-0.2	28	0	4	0	6.3	-0.6
BPA	294	0	11	1.7	0.2	279	0	9	0	7.8	0.2
BWA	109	1	7	1.8	-0.3	88	0	5	0	5.5	0.5
CFC	40	0	8	1.7	-0.4	43	0	12	0	7.0	0.2
CFG	383	0	8	1.5	0.1	279	0	8	0	7.6	0.5
CKS	90	0	7	1.8	0.1	63	2	8	0	9.1	1.4
CLX	282	1	5	1.8	-0.5	137	0	4	0	7.1	-0.2
COA	149	1	33	1.5	-0.1	103	0	38	0	7.6	1.0
CRL	251	0	7	1.8	0.1	210	0	6	0	8.9	0.2
CUB	66	0	5	1.9	1.0	53	0	4	0	8.8	0.6
DAL	188	0	7	1.7	-0.9	125	0	10	0	8.6	0.5
DCS	52	0	8	1.7	-0.3	34	0	0	0	3.9	-0.1
DHL	110	5	100	6.8	-6.7	57	0	21	0	12.9	3.6
DLH	439	1	12	1.4	0.2	394	0	10	0	6.8	0.2
DRD	44	0	16	3.4	0.8	44	0	5	0	8.2	0.9
EEZ	45	0	4	1.4	0.2	45	2	7	0	6.3	0.9
EIA	238	1	16	1.6	-0.2	224	0	100	0	21.8	9.5
ELY	75	0	4	1.7	-0.5	37	0	5	0	8.0	-0.6
ETH	20	0	10	1.1	-0.2	20	0	10	0	3.5	-0.1
FCA	100	2	6	1.6	0.2	67	0	51	0	5.3	0.8
FDX	587	0	44	1.4	0.3	350	0	40	0	5.4	-0.1
FIN	305	1	5	1.6	0.1	194	0	1	0	3.6	0.2
FWI	168	1	7	2.0	-0.3	158	0	4	0	7.6	0.7
GCO	115	1	12	1.5	0.0	116	0	100	0	9.1	0.9
GRL	67	0	0	1.4	0.1	59	0	0	0	4.1	0.7
GTI	176	1	16	2.6	1.1	156	0	9	0	6.0	0.3
IBE	1480	1	4	1.6	0.3	1459	0	5	0	7.6	0.5
ICE	1040	0	3	1.3	-0.1	551	0	3	0	5.7	1.0
ISR	62	5	8	1.9	0.0	31	0	0	0	6.7	0.4
IWD	192	0	5	1.7	0.1	192	0	5	0	7.5	0.9
KLM	753	1	5	1.8	-0.3	471	0	6	0	8.0	0.4
LAN	24	0	25	3.2	-1.3	23	0	9	0	6.6	0.2
LDI	144	3	10	2.2	-0.1	97	0	7	0	8.5	2.2
LOT	447	0	4	1.8	0.0	256	0	3	0	6.9	0.3
LTU	481	0	8	1.8	-0.2	363	0	7	0	6.3	0.8
MPD	116	0	3	2.0	0.3	96	0	1	0	6.7	0.7
MPH	312	1	9	1.8	-0.4	176	0	9	0	8.6	0.2
MYT	233	0	6	1.6	0.0	140	0	4	0	5.1	0.6
NAO	22	0	23	2.3	0.5	20	0	15	0	9.3	1.6
NCA	32	0	0	1.3	-0.6	29	0	3	0	9.8	0.4
NWA	1925	2	9	2.0	0.5	1739	0	4	0	7.5	0.3

OAE	168	0	7	1.6	-0.1	81	0	9	0	9.6	2.1
OOM	136	0	2	1.5	-0.8	92	0	4	0	5.8	0.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
PAC	195	0	8	1.6	-0.2	158	0	6	0	5.1	-0.5
PLM	107	2	8	2.2	1.6	98	0	9	0	8.9	-0.2
RAM	284	0	3	1.7	0.4	204	0	5	0	7.8	0.1
RCH	230	0	100	3.2	-1.0	152	1	100	0	13.4	2.4
RRR	83	4	6	1.9	-0.4	80	0	5	0	6.5	1.2
RZO	208	0	3	1.6	-0.6	175	0	4	0	7.4	0.1
SEU	77	1	9	1.7	-0.2	54	0	9	0	12.8	-0.3
SLM	32	0	9	1.4	0.7	30	0	10	0	12.0	0.6
TAP	240	0	3	1.5	-0.3	189	2	6	0	9.7	0.5
TCX	121	0	6	1.7	0.2	55	0	11	0	9.5	0.3
TFL	108	0	5	1.1	-0.1	70	0	6	0	10.4	1.2
TSC	257	0	4	1.7	-0.5	159	0	1	0	5.2	0.1
TUB	110	0	3	1.7	-0.5	38	0	3	0	10.0	-1.0
UAE	23	0	0	1.9	0.4	22	0	0	0	4.8	1.1
UAL	80	0	68	1.6	-1.0	58	2	67	0	6.0	0.2
UPS	692	0	50	1.6	0.1	648	0	50	0	7.1	-0.2
USA	27	0	11	2.3	-0.1	23	0	4	0	6.3	0.5
VIR	38	0	5	1.2	0.1	22	0	5	0	4.5	1.3
WOA	219	1	9	1.5	0.2	168	0	10	0	8.7	0.8
XLA	62	0	6	2.4	0.3	47	0	6	0	9.2	0.7

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EU	32996	0	21	1.1	0.2	32996	0	20	0	3.8	0.2
TN	38	3	11	2.6	1.3	39	0	5	0	5.1	-0.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	444	1	8	2.2	0.7	218	0	7	0	6.7	0.6
U	25744	0	36	1.3	0.2	25744	0	32	0	4.2	0.1

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	12	Z	100	24	0	18.2	18.4	2.4
EBUQ	12	Z	100	12	1	20.1	23.5	12.3
ELML7	00	Z	100	4	0	14.2	29.0	25.3
ELML7	12	Z	100	6	0	6.8	18.6	17.3
FQFL	00	Z	100	6	0	21.5	26.1	14.8
FQFL	12	Z	100	6	0	21.7	25.6	13.5
FQFM	00	Z	100	10	0	19.9	21.0	-6.6
FQFM	12	Z	100	13	0	13.3	13.5	-1.9
HPII	00	Z	100	6	0	9.5	10.0	3.0
HPII	12	Z	100	5	0	17.0	26.9	-20.8
KRPD	00	Z	100	2	0	14.5	29.3	25.5
KRPD	12	Z	100	3	0	13.4	29.3	26.0
LDWR	00	Z	100	29	0	11.9	14.7	8.6
LDWR	12	Z	100	29	0	14.8	15.0	2.5
OXVH2	00	Z	100	1	0	0.0	25.0	25.0
OXVH2	12	Z	100	1	0	0.0	16.0	16.0
OXYH2	00	Z	100	4	0	6.4	31.4	30.8
OXYH2	12	Z	100	4	0	13.3	31.0	28.0
SKUN	00	Z	100	10	0	19.6	27.6	19.4
SKUN	12	Z	100	10	0	9.5	18.2	15.5
V2UQ	00	Z	100	12	0	13.4	23.3	19.1
V2UQ	12	Z	100	13	0	9.7	20.4	18.0
V2XM	00	Z	100	2	0	3.5	34.7	34.5
V2XM	12	Z	100	2	0	4.5	23.9	23.5
WAAH	00	Z	100	14	0	21.7	53.2	48.6
WAAH	12	Z	100	17	0	10.1	60.9	60.0
ZCBE7	00	Z	100	4	0	16.8	27.9	22.3
ZCBE7	12	Z	100	5	0	11.5	29.9	27.6
ZCBF3	00	Z	100	4	0	8.2	61.1	60.5
ZCBF3	12	Z	100	3	0	16.7	70.4	68.3
ZCBP6	00	Z	100	13	0	10.3	47.9	46.8
ZCBP6	12	Z	100	14	0	10.6	47.6	46.4
03953	00	Z	100	29	0	12.5	25.6	22.4
03953	12	Z	100	31	0	11.0	20.6	17.5
04018	00	Z	100	30	0	8.1	16.6	14.5
04018	12	Z	100	31	0	8.6	13.5	10.4
04220	00	Z	100	28	0	25.5	34.1	22.6
04220	12	Z	100	29	1	28.9	33.2	16.3
04270	00	Z	100	30	0	8.8	24.0	22.3
04270	12	Z	100	29	0	11.3	24.5	21.8
04339	00	Z	100	29	0	8.0	24.6	23.2
04339	12	Z	100	30	0	8.2	22.4	20.8
04360	00	Z	100	29	0	21.0	27.9	18.4
04360	12	Z	100	30	0	11.4	23.8	20.9
08001	00	Z	100	26	1	5.4	26.0	25.5
08001	12	Z	100	27	0	11.3	31.2	29.1
08508	00	Z	100	14	0	9.1	39.6	38.6
08508	12	Z	100	28	0	11.9	28.7	26.1
08522	12	Z	100	27	0	13.3	15.6	8.1
08594	12	Z	100	23	0	9.6	9.8	-2.2
71600	00	Z	100	30	0	11.6	18.6	14.5
71600	12	Z	100	31	0	10.5	25.6	23.4
72201	00	Z	100	30	0	11.4	25.9	23.3
72201	12	Z	100	31	0	14.9	31.6	27.9
72402	00	Z	100	30	0	11.6	43.5	42.0

72402	12	Z	100	30	0	11.4	26.3	23.7
74494	00	Z	100	28	0	11.7	18.6	14.4
74494	12	Z	100	30	0	10.5	16.4	12.6
78016	00	Z	100	27	0	9.7	27.7	26.0
78016	12	Z	100	31	0	14.8	35.2	31.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	12	Z	500	24	0	6.7	8.4	-5.1
EBUQ	12	Z	500	15	0	4.4	4.5	-1.1
ELML7	00	Z	500	7	0	9.9	10.4	-3.1
ELML7	12	Z	500	10	0	7.1	7.6	2.7
FQFL	00	Z	500	9	1	10.7	11.0	-2.4
FQFL	12	Z	500	10	0	12.1	14.0	-7.1
FQFM	00	Z	500	10	0	9.1	15.2	-12.2
FQFM	12	Z	500	13	0	5.9	12.2	-10.7
HPII	00	Z	500	7	0	4.2	8.3	-7.1
HPII	12	Z	500	5	0	8.4	24.1	-22.6
KRPD	00	Z	500	2	0	1.5	4.7	-4.5
KRPD	12	Z	500	4	0	15.1	15.1	-0.5
LDWR	00	Z	500	30	0	7.8	8.2	2.6
LDWR	12	Z	500	29	0	11.3	11.3	0.4
OXVH2	00	Z	500	1	0	0.0	18.0	18.0
OXVH2	12	Z	500	2	0	2.0	14.1	14.0
OXYH2	00	Z	500	5	0	5.7	18.7	17.8
OXYH2	12	Z	500	4	0	6.1	13.9	12.5
PACDG	00	Z	500	2	0	4.5	4.5	0.5
PACDG	12	Z	500	1	0	0.0	3.0	-3.0
SHIP	00	Z	500	6	0	15.4	17.0	7.0
SHIP	12	Z	500	2	0	3.0	3.2	-1.0
SKUN	00	Z	500	10	0	19.0	19.0	0.7
SKUN	12	Z	500	10	0	9.1	9.1	0.2
V2UQ	00	Z	500	13	0	4.8	4.9	-1.0
V2UQ	12	Z	500	14	0	7.4	9.0	-5.1
V2XM	00	Z	500	2	0	5.0	23.5	23.0
V2XM	12	Z	500	2	0	6.0	16.2	15.0
WAAH	00	Z	500	16	0	19.7	35.6	29.6
WAAH	12	Z	500	17	0	7.3	36.2	35.5
ZCBE7	00	Z	500	5	0	21.3	21.8	4.6
ZCBE7	12	Z	500	5	0	9.9	11.5	-6.0
ZCBF3	00	Z	500	4	0	2.2	25.1	25.0
ZCBF3	12	Z	500	3	0	5.4	21.0	20.3
ZCBP6	00	Z	500	13	0	8.5	34.2	33.2
ZCBP6	12	Z	500	14	0	9.5	34.6	33.2
03953	00	Z	500	29	0	8.1	9.7	5.3
03953	12	Z	500	31	0	5.1	6.8	4.4
04018	00	Z	500	30	0	7.3	11.4	8.8
04018	12	Z	500	31	0	7.1	14.7	12.8
04220	00	Z	500	28	0	15.4	20.1	12.9
04220	12	Z	500	29	1	15.8	18.1	8.9
04270	00	Z	500	30	0	7.2	12.0	9.6
04270	12	Z	500	29	0	6.0	9.7	7.7
04339	00	Z	500	29	0	10.0	16.6	13.3
04339	12	Z	500	30	0	8.3	18.7	16.8
04360	00	Z	500	29	0	10.6	13.4	8.1
04360	12	Z	500	30	0	8.9	14.3	11.2
08001	00	Z	500	29	0	7.5	9.1	5.2
08001	12	Z	500	28	0	7.1	9.5	6.3
08508	00	Z	500	14	0	6.8	8.1	4.3
08508	12	Z	500	28	0	7.8	7.9	-0.9
08522	12	Z	500	30	0	7.5	7.8	-2.1
08594	12	Z	500	26	0	7.1	8.4	-4.4
71600	00	Z	500	30	0	10.2	10.3	1.3

71600	12	Z	500	31	0	7.3	8.1	3.6
72201	00	Z	500	30	0	3.5	3.5	-0.2
72201	12	Z	500	31	0	5.2	5.7	-2.4
72402	00	Z	500	30	0	7.6	8.3	3.4
72402	12	Z	500	30	0	5.6	5.8	1.3
74494	00	Z	500	30	0	6.3	6.3	-0.2
74494	12	Z	500	30	0	7.7	7.7	1.0
78016	00	Z	500	30	0	7.2	11.2	8.6
78016	12	Z	500	31	0	9.0	14.6	11.5

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	12	V	100	23	0	0	6.2	-1.8	-0.2
EBUQ	12	V	100	7	0	0	8.9	2.8	-3.3
ELML7	00	V	100	4	0	100	10.2	6.9	6.5
ELML7	12	V	100	6	0	100	10.6	8.0	5.0
FQFL	00	V	100	5	0	0	4.9	-1.9	-0.4
FQFL	12	V	100	7	0	0	2.6	-0.4	-0.8
FQFM	00	V	100	9	0	0	3.9	0.7	-0.7
FQFM	12	V	100	12	0	0	3.4	-1.1	1.1
HPII	00	V	100	5	0	0	3.2	-1.3	0.3
HPII	12	V	100	6	0	0	3.4	0.9	-0.6
KRPD	00	V	100	2	0	100	2.3	0.8	-2.2
KRPD	12	V	100	2	0	100	5.1	-3.3	2.0
LDWR	00	V	100	29	0	0	1.9	-0.1	0.3
LDWR	12	V	100	29	0	0	2.1	-0.1	0.1
OXVH2	00	V	100	1	0	0	5.0	3.4	3.7
OXYH2	00	V	100	1	0	0	9.4	4.3	8.4
SKUN	00	V	100	10	0	0	2.6	-0.2	0.7
SKUN	12	V	100	9	0	0	3.1	1.1	0.2
V2UQ	00	V	100	12	0	0	4.2	0.5	-0.2
V2UQ	12	V	100	12	0	0	4.1	-1.7	1.2
V2XM	00	V	100	2	0	0	0.8	-0.1	0.6
V2XM	12	V	100	2	0	0	2.4	0.4	2.1
WAAH	00	V	100	14	0	0	3.2	-0.7	0.5
WAAH	12	V	100	16	0	0	2.7	-0.3	-0.6
ZCBE7	00	V	100	4	0	0	4.7	2.5	0.1
ZCBE7	12	V	100	5	0	0	6.4	5.1	-0.1
ZCBF3	00	V	100	2	0	0	3.8	-1.3	-1.2
ZCBF3	12	V	100	1	0	0	1.2	-0.4	-1.1
ZCBP6	00	V	100	12	0	0	3.5	0.3	0.2
ZCBP6	12	V	100	14	0	0	3.0	0.3	-0.1
03953	00	V	100	29	0	0	2.6	0.0	-0.2
03953	12	V	100	31	0	0	2.4	0.4	0.2
04018	00	V	100	30	0	0	1.9	0.1	0.6
04018	12	V	100	30	0	0	1.7	0.4	-0.2
04220	00	V	100	28	0	0	2.7	-0.5	0.2
04220	12	V	100	30	0	0	2.3	-0.5	-0.2
04270	00	V	100	29	0	0	3.9	-0.6	0.6
04270	12	V	100	29	0	0	3.0	-0.9	0.3
04339	00	V	100	28	0	0	4.6	0.5	-0.1
04339	12	V	100	27	0	0	4.4	-0.9	0.5
04360	00	V	100	29	0	0	2.5	-0.8	0.9
04360	12	V	100	29	0	0	2.7	-0.3	0.2
08001	00	V	100	24	0	0	4.1	1.1	0.4
08001	12	V	100	24	0	0	2.6	0.1	0.3
08508	00	V	100	8	0	0	3.9	-1.9	-0.4
08508	12	V	100	16	0	0	3.5	-0.4	0.7
08522	12	V	100	24	0	0	4.5	-0.9	0.4
08594	12	V	100	23	0	100	4.7	0.3	-2.3
71600	00	V	100	30	0	0	3.9	1.4	0.9
71600	12	V	100	31	0	0	3.5	0.0	0.3
72201	00	V	100	30	0	0	3.8	-0.9	0.1
72201	12	V	100	31	0	0	4.5	1.0	1.1
72402	00	V	100	30	0	0	4.4	-0.7	0.9
72402	12	V	100	30	0	0	3.9	1.0	0.3
74494	00	V	100	28	0	100	3.1	-0.7	0.8

74494	12	V	100	30	0	100	2.7	-0.6	0.3
78016	00	V	100	27	0	0	4.3	-0.2	-1.1
78016	12	V	100	31	0	0	5.0	0.8	0.3

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: May 2005

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	12	V	500	24	0	0	3.5	-0.5	0.3
EBUQ	12	V	500	12	0	8	7.3	-0.1	-0.6
ELML7	00	V	500	4	0	100	9.3	7.0	5.9
ELML7	12	V	500	7	0	100	10.5	5.8	4.6
FQFL	00	V	500	10	0	0	4.8	2.1	-1.0
FQFL	12	V	500	10	0	0	4.2	-1.0	0.8
FQFM	00	V	500	10	0	0	3.0	0.1	0.2
FQFM	12	V	500	13	0	0	3.6	1.2	0.3
HPII	00	V	500	7	0	0	3.1	-0.3	1.1
HPII	12	V	500	6	0	0	4.0	-1.0	0.8
KRPD	00	V	500	1	0	100	3.1	0.0	-3.1
KRPD	12	V	500	2	0	100	3.2	0.1	3.1
LDWR	00	V	500	30	0	0	3.6	-0.1	-0.7
LDWR	12	V	500	29	0	0	4.0	-0.3	-0.8
OXVH2	00	V	500	1	0	0	1.8	0.6	1.7
OXVH2	12	V	500	2	0	0	5.5	0.7	-2.6
PACDG	00	V	500	2	0	0	4.2	0.6	0.5
SHIP	00	V	500	6	0	0	3.0	-0.3	1.0
SHIP	12	V	500	2	0	0	3.0	2.5	-0.7
SKUN	00	V	500	10	0	0	5.1	-0.9	-1.5
SKUN	12	V	500	9	0	0	2.2	1.0	-0.9
V2UQ	00	V	500	12	0	0	4.1	0.0	-0.9
V2UQ	12	V	500	13	0	0	4.3	0.9	0.4
V2XM	00	V	500	2	0	0	2.1	-1.8	-0.1
V2XM	12	V	500	2	0	0	3.2	-1.2	2.5
WAAH	00	V	500	16	0	0	2.4	-0.8	0.3
WAAH	12	V	500	17	0	0	3.9	-0.5	1.7
ZCBE7	00	V	500	5	0	0	4.0	0.9	1.2
ZCBE7	12	V	500	5	0	0	6.3	2.1	-1.8
ZCBF3	00	V	500	2	0	0	4.0	-2.1	-2.1
ZCBF3	12	V	500	1	0	0	4.8	-3.0	3.8
ZCBP6	00	V	500	12	0	0	4.0	-0.3	0.7
ZCBP6	12	V	500	14	0	0	3.4	0.5	0.0
03953	00	V	500	29	0	0	4.2	0.5	0.1
03953	12	V	500	31	0	0	3.2	0.4	1.0
04018	00	V	500	30	0	0	2.9	-0.1	0.5
04018	12	V	500	31	0	0	2.5	-0.3	-0.1
04220	00	V	500	28	0	0	3.6	-0.6	-0.9
04220	12	V	500	30	0	0	3.4	-1.0	0.1
04270	00	V	500	30	0	0	3.8	-0.2	0.3
04270	12	V	500	29	0	0	2.4	0.0	0.1
04339	00	V	500	28	0	0	4.8	-0.3	-0.2
04339	12	V	500	30	0	0	4.6	0.7	0.4
04360	00	V	500	29	0	0	4.3	-0.9	0.6
04360	12	V	500	30	0	0	2.9	0.1	0.3
08001	00	V	500	29	0	0	4.4	0.6	1.3
08001	12	V	500	23	0	0	5.2	0.0	1.2
08508	00	V	500	7	0	0	5.6	-0.7	1.6
08508	12	V	500	16	0	0	3.4	0.1	0.0
08522	12	V	500	26	0	0	2.9	-0.4	0.5
08594	12	V	500	25	0	0	3.7	0.2	-0.7
71600	00	V	500	30	0	0	4.7	-0.1	-0.9
71600	12	V	500	31	0	0	3.5	-0.3	0.0
72201	00	V	500	30	0	0	3.0	0.2	0.0
72201	12	V	500	31	0	0	2.8	-0.2	-0.9

72402	00	V	500	30	0	0	2.7	0.2	0.3
72402	12	V	500	30	0	0	3.6	0.4	0.0
74494	00	V	500	29	0	0	3.3	-1.0	-0.1
74494	12	V	500	29	0	0	4.4	0.0	0.6
78016	00	V	500	30	0	0	3.2	-1.0	0.8
78016	12	V	500	31	0	0	2.9	0.0	1.0

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45